

THE *Soybean Digest*



Soil builder or soil robber? (See page 15).

Official Publication
AMERICAN SOYBEAN ASSOCIATION

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THE Soybean Digest

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MAY, 1949

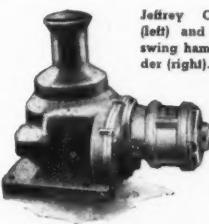


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Jeffrey 3-pulley Belt Idler (above); a Jeffrey Bucket Elevator is shown right; Jeffrey Spiral Flight and installation (below).



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EDITOR'S DESK

FACE A BASIC DECISION

Text of the Gillette-Wherry bill known as S.1591 is carried on page 53 of this issue. It is something which every producer, handler and processor of soybeans should study carefully. Consideration of it involves a basic decision on the course which this nation is to take on all imports and exports.

Fats and oils touch more segments of American agriculture than any other commodity. Soybeans, cottonseed, corn, lard, beef, flux, tung, peanuts, butter and renderers products are all involved in fats and oils markets. During the war years we have built up a production of these commodities which is sufficient for our own needs and for exports under favorable production conditions. Prior to the war we were large importers. That situation has changed—and most people have not recognized it.

The Gillette-Wherry bill would, in effect, place an import duty on the excess of imports of fats and oils or oil-bearing commodities into the United States above the exports which we make. That duty would tend to hold fats and oils at parity price in this country, have very little effect upon world markets or our world trade.

To us, it seems the most logical approach yet suggested to this problem. We are now faced with the basic decision as to whether we are going to maintain our present production levels of fats and oils or whether we are going back to open importation and ruination of perhaps half the fats and oils industry of the nation. Soybean growers, soybean handlers and processors, the cottonseed industry, the flax industry, all livestock producers, all packers and renderers, and all dairymen have a stake in retention of domestic production and the consequent regulation of imports. Producers of soap, shortenings, margarine and surface coatings may have a stake in open trading—but over a period of time we doubt it. There is a basic decision facing us right now. S.1594 asks the nation to face up to it.

JOB FOR HARVESTER FIRMS

The funeral pyres of soil fertility burned all over the soy belt again this spring. Confronted with the task of spreading or otherwise disposing of soybean straw, before preparing seed beds, far too many growers again took the easy way out and raked and burned that precious commodity. In so doing they destroyed the humus and the soil elements which were contained, losing them forever to crop production.

Straw spreaders for combines which do an adequate job of spreading the straw evenly over the area harvested are the answer. Too many combines are operated with no straw spreader or with a spreader which does not do the job. Allowing the straw to accumulate in windrows makes the disposal problem much more acute, tends to encourage burning, encourage erosion, encourage the very practices which need to be discouraged.

To the manufacturers of combines we have one suggestion: NO COMBINE SHOULD BE OFFERED FOR

SALE IN SOYBEAN PRODUCTION TERRITORY WITHOUT A STRAW SPREADER WHICH WORKS. In fairness to the combine and the operator everything possible should be done to encourage use of straw spreaders on soybean straw. Some of the straw spreaders which have been supplied by manufacturers have been so inadequate that an operator could not be blamed for disconnecting or removing the unit.

Preservation of soybean production at favorable levels necessitates encouragement of every possible soil conservation measure. Any manufacturer who sells a combine into soybean territory without a proper straw spreader is doing a disservice to himself and the soybean industry, as well as to the grower who buys that unit. A GOOD STRAW SPREADER SHOULD BE AN INTEGRAL PART OF EVERY COMBINE SOLD. THERE SHOULD BE NO VARIANCE FROM THIS!

FINE GERMAN EFFORT TO BETTER DIET

One of the interesting chapters in man's efforts to feed himself is being written in Germany now. For centuries the peoples of China, Manchuria, Japan and other Asiatic countries have relied on the soybean for their protein. As a result of the war and the shortage of animal products which it induced it is utterly impossible to supply animal proteins for the people of European countries. The need for adequate protein levels in the human diet is greater now than ever before in countries such as Germany. Neither the United States nor her allies nor the local populations can supply those proteins from animal sources. The best possible alternative must be used—and that appears to be the completely balanced proteins of the soybean.

Elsewhere in this issue is the story of developments in Germany as related by Dr. William Bening. Through cooperation between agencies of military government, the butchers' organizations and the firm which has developed the process of combining the soy protein and the meat products, a wholesome, tasty and highly nutritious product is being offered to the people of Germany. It is entirely adequate in its nutritional levels, and supplies the much-needed protein and fat at a much lower unit cost than any other food product available. It is an intelligent attempt to provide the food which the German people need in order to restore and rebuild health levels.

Dr. Bening and the military government officials in charge of the food program in Germany are to be congratulated on this big step forward. American soybean producers will watch with intense interest the developments during the coming months.

MARGARINE BILL NEEDS ONE MORE PUSH

As we predicted last month, the finance committee of the United States Senate has reported to the floor of the Senate a margarine bill which is essentially HR 2023, with three minor amendments. It is expected that some time will elapse before the bill receives consideration on the floor, but only the one hurdle remains uncleared before the housewives of America can buy their margarine free of federal taxes and colored as they want it.

Nearly half the states of the nation, however, still



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retain their own brands of restrictions and taxes. The next step must be that of making the changes in the states. Then, and then only, will we have a free and unrestricted sale for soybean oil in the margarine field.

The federal job needs only one more GOOD push—through the Senate. We must see that it gets that push. If you have not already written your Senators, do so today. Let's get the job done as quickly as possible. Then—let's get on with the states.

SMART NOT TO CUT ACREAGE IN 1949

Travel through several states by your editors, with frequent visits with producers of soybeans, reaffirms our fears that 1949 soybean acreage is going to be far below 1943 levels. Current reports from our correspondents, carried on page 38 and following indicate considerable cut in acreage. The only factor which will now materially influence acreage for 1949 is weather. Should we have an unfavorable planting season for corn and cotton a portion of those acreages might go into soybeans.

Assuming normal weather and thus decreased acreage, soybeans should be in a favorable price position at 1949 harvest. We will have more cotton and corn than can possibly be utilized. The cotton acreage will provide cottonseed oil and cottonseed meal, but in smaller quantities. Corn will indirectly provide lard.

But the nations of the world want American soybeans. They provide the cheapest source of edible protein and edible oil in the world today. Even at con-

siderably higher prices they would continue to be a good buy. The man who grows a good crop of soybeans in 1949 will probably find a very favorable market for his crop without too much trouble.

A FAR REACHING FARM REVOLUTION

American agriculture is in the midst of a farm revolution the nature and extent of which is fully understood by few persons now alive. It started several years before the war, was speeded up by the greatly increased demands for food and fiber here and abroad during the war years. Factors involved in the farm revolution include:

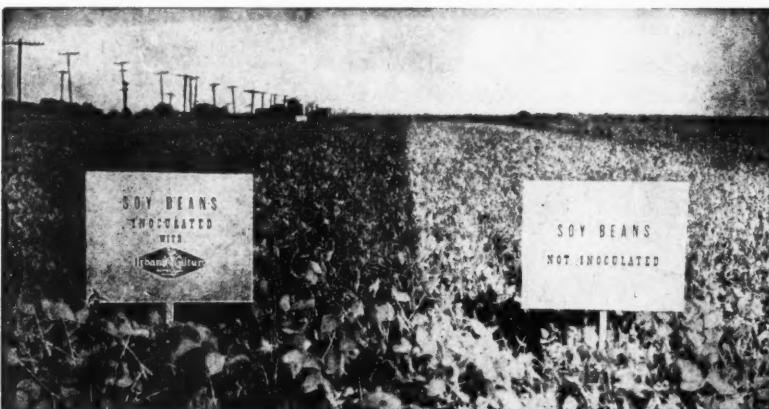
- (1) Increased mechanization of farms and the consequent greatly increased production per worker.
- (2) Increased yields due to improved varieties, greater use of fertilizers, and improved agricultural methods.
- (3) Improved living standards on farms through expanded rural electrification, all-weather roads, radio and telephones.
- (4) More control by farmers over their markets and marketing systems through both private and governmental channels.
- (5) Increased cooperation among rural people in those things which tend to raise the social and cultural standards of the rural community.

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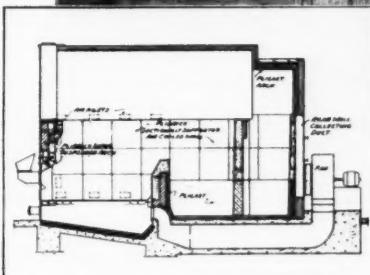
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This Swift & Company mill has recently been converted to the solvent extraction process. It is significant that Plibrico construction was chosen for the new boiler required; if the "miracle" bean has any counterpart in refractories, Plibrico is it.

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SOYBEANS ARE WORTH MORE MONEY

ACTIVITIES OF YOUR ASSOCIATION

PLAN SERIES OF ILLINOIS MEETINGS

A series of informational meetings on the American Soybean Association program is planned for central Illinois in late May or early June, says Paul C. Hughes, Association field service director.

The meetings will be similar to the highly successful ones held in Missouri, Arkansas and Tennessee in April and in Ohio in February. Hughes and other association leaders will be present to explain the program in detail and to make it worthwhile for soybean producers to attend.

Exact dates and places of the Illinois meetings will be announced through local newspapers and radio stations. Information on local and national influences that affect the markets for soybeans, and the efforts of the Association to bring about better prices for growers and others in the industry will be presented.

Members will thoroughly explain the Association program, financed

voluntarily by soybean growers through the payment of 20c per 100 bushels and collected through local elevators.

About 200 growers, some of them traveling considerable distances, attended the four meetings held April 18-21 at Sikeston, Mo.; Portageville, Mo.; Blytheville, Ark. and Tiptonville, Tenn.

Local chairmen were: at Sikeston, Heartsill Banks, O. H. Acom Farms, Wardell, Mo.; Portageville, J. A. DeLisle, chairman of the National Soybean Festival at Portageville; Blytheville, George Hale, Hale Seed Farms, Burdette, Ark.; Tiptonville, S. G. Martin, county agent, Lake County, Tiptonville.

Speakers included Banks, Hughes and ASA Secretary-treasurer Geo. M. Strayer. Banks gave a short review of the history of U. S. soybean growing and the American Soybean Association.

Strayer reviewed events at Wash-

ington where he has been called frequently for governmental hearings, and other matters that affect the soybean industry and call for Association action.

Hughes explained in detail the way the Association program is set up.

The Sikeston growers passed a resolution calling on people in that territory to support the Association program.

Hughes promised to hold a meeting at St. Charles, Mo., some time during the summer.

Hughes discussed the program of the Association as a speaker before the Illinois Grain Dealers Association in Peoria May 4.

Margarine Hearings

Representatives of the Association testified for margarine repeal bills before the Senate finance committee in Washington, D. C., April 12 and before the House and Senate finance committees of the Illinois legislature April 20 and May 3.

For details see the report on margarine legislation elsewhere in this issue.

Convention Theme

"Soybeans Are Worth More" will be the theme of the 1949 American Soybean Association convention, the program committee announces.

Association leaders felt the theme was appropriate when they first began preaching "Soybeans are worth more" over a year ago. With the present unfavorable price of soybeans it becomes of much greater significance. As President Ersel Walley said, "When the chips are down, the price paid for soybeans will determine the acreage planted."

This year's program will be built around that theme.

Convention will be held at Hotel Nicollet in Minneapolis September 6, 7 and 8, as previously announced on this page.

Circle the dates Sept. 6, 7 and 8 on your calendar.

SEPTEMBER 1949

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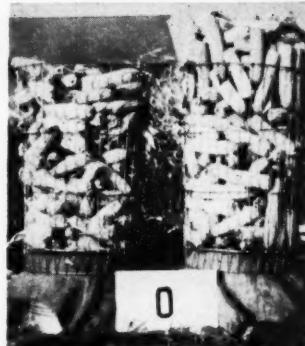
Are there any advantages to the planting of alternate rows of corn and soybeans? Of course much more experimental work needs to be done before any definite conclusions can be drawn, but according to recent tests at the University of Illinois there is every reason to believe that certain advantages exist when using this alternate row system.

The yields of corn were increased approximately 11 bushels per acre where alternate double rows of corn and soybeans were grown, over the check plots where corn was planted solidly. Single rows of corn and soybeans were also alternated and double pairs of rows or four rows of corn and four rows of soybeans were also alternated. These two conditions also gave increased yields over the plots which were solidly planted to corn.

Several other measurements were taken besides yield to indicate that certain advantages exist from using the alternate row system. The ears of corn taken from the alternate row plots were greater in length and larger in diameter than the ears from the plots planted solidly to corn. The stalks were larger in diameter and shorter in height on the alternate row plots which would lead one to believe that you would get less lodging on these plots. The moisture content of the corn on the alternate row plots was lower at harvest time than on the plots of continuous corn. This was probably due to better air circulation and less competition.

The advantages obtained from alternating double rows of corn and soybeans may be due to the better relationships of the growth factors of organic matter, sunlight, plant nutrients, air movements, moisture, etc. There may also be an advantage to the alternate growing of a legume crop with a non-legume crop, to the alternating planting of a high and low growing crop, to the alternate planting of two crops having different nitrogen relationships, and to the alternate planting of two crops which have roots feeding in different layers of the soil.

The yields of soybeans were also taken. There was less than one bushel difference between the yields



Wire basket on left shows the amount of corn produced where corn was bordered by corn; on right, amount produced by alternate rows.

of soybeans which was alternated with corn, and the soybeans which were planted solidly. The solidly planted plots of soybeans yielded the higher.

The corn and soybeans were both planted on the same date in rows 40 inches apart. On a large scale the alternate double rows of corn and soybeans could be planted by putting corn in one of the planter boxes and soybeans in the other. The cultivation can be accomplished in the normal manner. It would be desirable to have a small push type combine to harvest the beans first from between the rows of corn since normally the soybeans are harvested before corn. Then the corn could, of course, be harvested in the normal manner.

Of course these ideas are only in the experimental stages and much more work needs to be done before standard recommendations for cultural practice can be stated. Rates of planting, spacing of rows, fertility practices, and even the proper varieties to use will have to be thoroughly investigated before standard recommendations can be made.

Much more extensive alternate row experiments are being planned for the coming season at the University of Illinois. The yields of both corn and soybeans in alternate row systems will again be checked. The spacing of rows, population of plants per acre and the effect of fertilizer treatment on the yields will also be studied this coming season.

Other investigators at the University of Illinois have reported yield increases of from 8 to 27 bushels per acre by using the alternate row system. The entire system

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—Photo Bloomington (Ill.) Pantagraph

A. L. Long (left) and Hilst at the processor meeting at Urbana. Both are working on the alternate row idea.

is based on the fact that apparently alternate rows of corn and soybeans do not offer as much competition to each other as row after row of corn or row after row of soybeans.—Arvin R. Hilst, department of agronomy, University of Illinois, Urbana, Ill. as reported to soybean processor meeting at Urbana.

Mr. Hilst Writes: "We are now planning our alternate row experiments for this coming season. We plan to have a test plot at each of the following locations: Hartshurg (central Illinois), Urbana (southeast-

ern), and Joliet (northern).”—Editor.

Increase in Arkansas

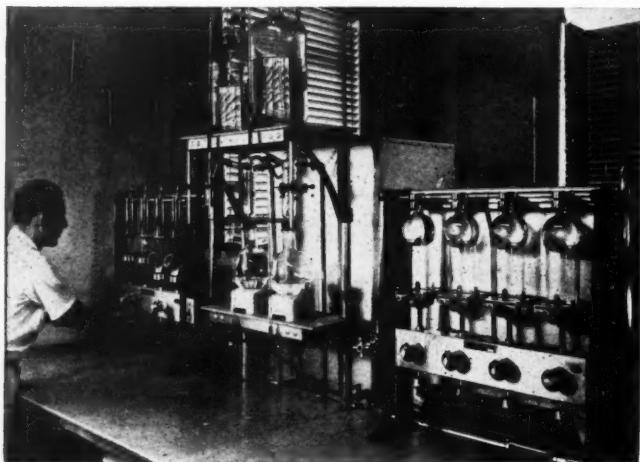
An estimated 30,000 acres of land intended for cotton in Mississippi County, Ark., will be converted to soybeans in 1949 due to an assured government support price for beans. Keith J. Bilbrey, North Mississippi County extension agent, stated at the annual meeting of the Soybean Planning Committee at Blytheville April 15.

"Government support prices for soybeans are a god-send to Mississippi County farmers for 1949," said Bilbrey. He pointed out, that with a reasonable price for soybeans assured a more balanced agricultural program and a more stabilized cotton chopping and picking prices would be the result.

The committee voted to make a concerted effort to inform Mississippi County farmers of the benefits of soybean planting and the new price support program. Seed houses will issue circulars to farmers with information about soybean production, and there will be extensive promotion through magazines and newspapers.

The committee voiced approval of

— Advertisement —



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the annual soybean yield contest, sponsored by the Blytheville Jaycees the past two years, as one of the best inducements for growing soybeans.

George Hale, Burdette, Ark., was reelected chairman of the Soybean Planning Committee.

Other speakers at the annual meeting were Hildred Bunch, agricultural and economics student, J. L. Gunn, manager of the Swift & Co. soybean mill at Blytheville, and E. E. Chandler, assistant county agent and co-chairman of the Blytheville Jaycee agricultural committee.

Southeast Missouri

Soybean harvest can be hastened in southeast Missouri as a means of making way for small grain on the soybean field by planting the early maturing varieties early, according to C. V. Feaster of the U. S. Regional Soybean Laboratory, Columbia, Mo.

Both the use of an early maturing variety and early planting are essential to early maturity, says Feaster. This practice may cause considerable reduction in soybean yield and quality. But it is still considered sound from the standpoint of total production in the rotation.

If planting is delayed because of wet weather or until after the harvest of small grains, the use of late maturing varieties is recommended, as early varieties will give lower yield of seed without much gain in earliness of maturity.

Varieties used in the experiment were S-100, Ralson and Dunfield.

See Bulletin 514, Effect of Planting Time on Maturity, Yield and Quality of Soybeans in Southeast Missouri, by C. V. Feaster, Agricultural Experiment Station, Columbia, Mo.

In Mississippi

Results in Mississippi are much the same. Paul R. Henson and R. B. Carr stress the importance of planting early varieties, such as S-100 and Gibson, early in the planting season for maximum yields.

Fitted to Combine

The Wabash soybean, bearing its lower pods a bit higher up from the ground than usual, is one of the latest examples of how plant breeders are gradually fitting important crops to mechanized farming, the U. S. Department of Agriculture points out. As a result of the seeds being borne further up on the stem, the combine should leave fewer of them on the ground.

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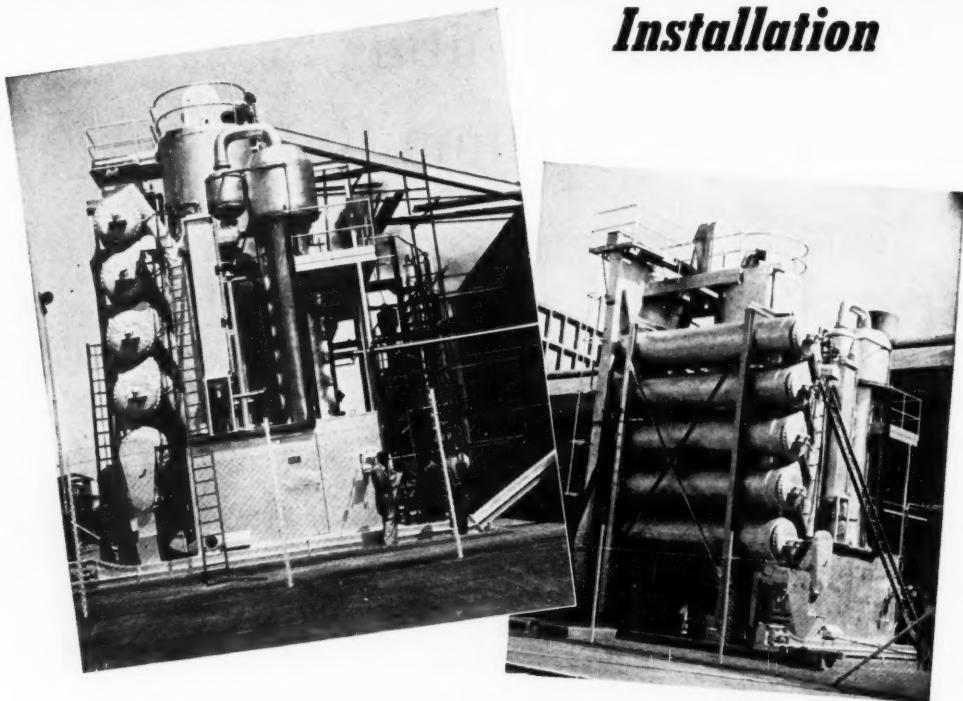
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**EXPELLERS AND
SOLVENT EXTRACTION
EQUIPMENT**

6 Wild Statements..about WHAT SOYBEANS DO TO YOUR LAND



By J. W. CALLAND

Managing Director, National Soybean Crop Improvement Council, From a talk at the Van Wert, Ohio, Soybean Roundup.

CROP AUTHORITIES agree that the following reasons have influenced the great expansion of soybean acreage.

Has a long period of time for planting.

Adapted to a wide variety of Corn-belt soils.

Easy crop to produce.

Handled with equipment used for corn and grain.

Lends itself to high degree of mechanization.

Better cash returns than wheat or oats.

Crop of Many Uses

Rapid growing hay and feed crop. Fits well in corn borer control rotation.

Fits well as a late planted crop. Provides excellent seed beds for small grains.

Better distribution of farm labor on many farms.

Beneficial loosening effect on tight, heavy textured soils.

Crop Can Take It

More tolerant to low temperatures than corn.

Relative freedom from insects and disease.

Grows on both acid and sweet soils but responds well to lime.

Adapted by late planting to poorly drained fields.

However, the soybean crop is not suited to all types of land, nor have all farmers found it to their liking. Now, when we don't like a thing in this country we generally make "wild statements" about it. Sometimes we make "wild statements" just because we don't understand things.

Let's take a look at some of the "wild statements" that have been made about soybeans. Here are six of them that maybe all of you have heard. There are a few more, but these six will be enough to examine now.

Six "Wild Statements"

1. Soybeans are hard on the soil.
2. Soybeans cause most of our erosion.

3. It's hard to get clover after soybeans.
4. You can't control weeds in soybeans.

5. Soybeans won't respond to fertilizer.
6. Soybeans won't fit into the rotation.

Wild Statement No. 1: Soybeans are hard on the soil.

This is a good one to start with. It is the Granddaddy of them all. First, how do crops affect the soil? Certainly the following factors

should be considered in evaluating a crop's effect on the soil.

1. Is the nitrogen supply increased or decreased?

2. To what extent are mineral elements removed from the soil?

3. How is the supply of organic matter affected?

4. What is the effect on soil tilth?

5. What is its influence on biological activity?

6. What is the carry-over effect on other crops?

For the next few minutes we shall consider these six questions in trying to see just what is the effect of soybeans on the soil.

First: How do soybeans affect the supply of nitrogen and mineral elements in the soil?

The University of Illinois in Bulletin 456, entitled, *Soybeans—Their Effect on Soil Productivity*, gives the figures at the bottom of the page on the plant food elements added or removed from the soil by various crops.

Here we see that soybeans actually add some nitrogen to the soil when the leaves, stems and roots are returned to the land. From the standpoint of removing mineral nutrients, soybeans rank about average among the common farm crops. Ohio agronomists in their table of "Soil Productivity Factors" place the soybean as mildly soil depleting, or in between the soil-building clovers and the soil-depleting grain crops. They rank soybeans as only one-half as

Crop	Acre Yield	Added Nitrogen	Nutrient elements removed per acre	Total Removed
		Ibs. N	Ibs. P K Ca	Ibs.
Corn (a)	50 bu.	50	.7 10 .5	69
Soybeans (b)	20 bu.	16	8.0 25 2.8	29 net
Aalfalfa (c)	3 tons	*	13.0 96 120.0	229
R. Clover (c)	2 tons	*	10.0 60 64.0	134
Wheat	25 bu.	36	6.0 7.5 .5	50
Oats	40 bu.	26	4.5 6.5 .8	38

(a) Corn sold, fodder returned.
(b) Beans sold, straw returned.
(c) Hay sold, no manure returned.
(* Not determined.)

● *From a talk before the Van Wert, Ohio, Soybean Roundup.*

soil depleting as wheat and oats, and only one-fourth as soil depleting as corn.

Second: What is the effect of soybeans on the organic matter supply?

Fortunately, only the soybean seed is removed from the land. The plant nutrients contained in the soybean stems, leaves and roots are returned to the soil. Thus, the soybean grower can add to the field some of the nitrogen gathered from the air and return as much as possible of the mineral matter taken from the soil.

Organic matter is quite important in soil. It not only influences the structure of the soil, but it is also the home of the micro-organisms whose activity makes plant nutrients available to plants. Soil depletion is largely the destruction of organic matter and the loss of soil minerals.

Third: What influence do soybeans have on biological activity and soil tilth?

Soybeans improve soil tilth and biological activity. The soybean is one of the annual crops with outstanding ability to loosen and mellow the soil and improve its granular structure. This is especially beneficial on heavy clay or silty clay loam soils. By improving the soil structure better aeration is promoted

and this creates a favorable environment for the roots of growing plants. The improved aeration and the increase in available nitrogen in the soil also have a stimulating effect on the number of micro-organisms which assist in the decay of plant tissues.

Soybeans improve the soil tilth by shading and protecting the soil from rain and by root action. The roots often go down 4 or 5 feet which is deeper than the roots of small grains, although not nearly so deep as clover and alfalfa. The roots and the bacterial action they foster tend to break up and loosen the soil mass, making it more crumbly, better aerated, more easily worked by tillage implements, and more easily penetrated by the roots of following crops. Soybeans leave heavy compact soils in much better physical condition than do corn and small grains.

Fourth: What is the effect of soybeans on following crops?

Experiments in many states have shown that soybeans, under a progressive system of soil management, have a beneficial effect on the crops that follow. Indiana tests at Purdue, covering 19 years, show that yields of corn, oats and wheat were all higher following soybeans than after any other crop except clover. Also, that on heavy soils the addition of

Some good farmers want a crop of well-cultivated soybeans in their rotation as a means of weed control.



soybeans to a rotation of corn, wheat and clover stepped up the yields of all the crops in the rotation, and gave greater dollar return for each year of the rotation. Corn and wheat yields were increased 5 and 6 bushels per acre.

Comparisons of corn yields following corn and following soybeans have been made for several years at Iowa. Results show corn yields 8.3 bu. and 9.5 bu. more following soybeans than where corn follows corn on the Webster and Clarion corn soils of Iowa. Likewise, oat yields were increased about 20 percent in Iowa when this crop followed soybeans compared to following corn.

Ohio Experiment Station tests over a period of 14 years showed that yields of wheat following soybeans averaged 3.4 bu. more than wheat following oats. Soybeans added to a rotation of corn, oats, sweet clover on the stubborn Paulding clay definitely raised the yield of both the corn and oats.

The beneficial effects of soybeans on the yields of other crops in the rotation have been reported by many other states and by farmers throughout the Cornbelt. This increased yield of following crops should very definitely be credited to soybeans when the net return from competing crops is figured. Doubtless many of you know of heavy clay farms right here in northwestern Ohio that were giving very poor yields of corn, but after a few crops of soybeans the corn crop gave a much better account of itself. This has happened on hundreds of so-called claypan farms of Indiana, Illinois and Missouri.

There is plenty of evidence coming from the experiment stations of the soybean states to show that the soybean is not hard on the soil when compared with other Cornbelt crops such as corn and small grains.

We must remember that all crops harvested and removed from the land deplete the supply of nutrient elements in the soil. These elements must be replenished by intelligent management practices.

Wild Statement No. 2: Soybeans cause most of our erosion.

The soybean is frequently referred to as a crop which accelerates erosion. Possibly you have heard someone say that it causes more erosion than any other farm crop. Yet, we know that most of the millions of acres of eroded land in America got that way before soybeans came into the picture. The improper handling of intertilled crops on sloping land may, of course, permit serious erosion. Especially, if the land



Soybeans can be planted on the contour on slopes and thus permit far less erosion than row crops like corn.

is left bare after the crop is harvested, or if two or more intertilled crops follow in succession.

There are wide differences between crops in their influence on erosion losses. Cultivated row crops are the least effective in preventing soil losses, small grain crops are intermediate, and sod crops are most effective. Soybeans are classified as a cultivated row crop when planted in rows, or as a close-grown crop like the small grains if drilled solid. Even on the fairly level lands of northwestern Ohio about 90 percent of the soybeans are planted solid.

A number of soybean states have recently been conducting tests where the runoff and soil losses from soybeans and from other crops have been carefully measured. After several years of checking, it is quite evident that soybeans when planted in 40-inch rows will permit less erosion than corn under the same conditions, and when planted solid will permit less than half as much as corn. The tilth improving action of the soybean crop makes the soil loose and granular and increases the water intake, thus reducing the amount of water available for transporting soil particles off the field.

Fortunately, soybeans can be readily drilled solid on land subject to erosion, also on the contour on steeper slopes and thus permit far less erosion than row crops like corn, which must be grown in wide rows. So, it appears that the way soybeans are handled determines the amount of erosion rather than any characteristic of the soybean.

Of course, it is a fact that you can get a lot of erosion on sloping land by growing two or three crops of corn on it and then planting it to

soybeans. But, remember that even then you will get less erosion with the soybean crop planted in rows than from another crop of corn, and far less if the soybeans are planted solid. Soil management is the important factor in controlling erosion.

Wild Statement No. 3: Soybeans cause clover failures.

The claim is sometimes advanced that the soybean is responsible for poor clover crops. This claim, however, is not supported by long-time results at various experiment stations. Ohio has recently reported on 4-year tests comparing the clover crops following corn with those following soybeans. Only one test out of 16 showed better results after corn. Purdue has reported on 4 years of studies where fields were partly in corn and partly in soybeans, with both crops followed by small grain and seeded to clover or alfalfa. In Purdue's tests the yields of legume hay following soybeans have topped the yields following corn, regardless of the fertilizer treatment used in all but one test. Illinois results are similar. Many farmers report their best yields of clover following soybeans.

Some investigators report that because soybeans leave the soil in good tilth and with more available nitrogen than is found after non-legumes, the small grains, particularly oats, following soybeans grow more vigorously and compete more strongly for moisture and plant nutrients, but make too much shade for the young clover plants. However, the correction of soil acidity and deficiencies of mineral nutrients when necessary, shallow planting of inoculated clover and alfalfa seed, and cultipacking the ground if it is too loose, will

—Photo Missouri Experiment Station

usually go a long way toward insuring a good clover crop regardless of whether you had corn or soybeans, or both, in your rotation.

Wild Statement No. 4: You can't control weeds in soybeans.

Occasionally, the complaint is made that soybeans have increased the weed problem on a given farm. Certainly, with no effort made to control them, weeds become a major problem in soybeans and also aggravate the weed problem in other crops. But why blame the soybeans?

Some good farmers, with fields where weeds are a serious problem, want a crop of well-cultivated soybeans in their rotation as a means of weed control. Soybeans planted in rows and properly cultivated can generally be kept free of weeds. Except on an occasional bad year when wet weather prevents cultural operations, weeds can be controlled in solid soybeans. Cornbelt experiment stations tell us. There are a few simple rules to follow:

1. Kill a crop of weeds before you plant soybeans.
2. Use the harrow or rotary hoe before weeds start.
3. Use them again after the soybeans are up.
4. Go over them again, if possible, in solid plantings.
5. Cultivate once or twice with cultivator in row plantings.
6. If you are proud of your farming, then you may want to remove a few by hand in the fall.

Proper cultural methods are the answer to weed problems in soybeans—just as with corn and other row crops. Of course, the weather may make it a little tough for you.

Wild Statement No. 5: Soybeans

won't respond to fertilizer.

Fertilizer applications on the soybean crop are not usually recommended on soils of average or better productivity. This is because:

1. Other crops usually respond better than soybeans to fertilizer applied at planting time.

2. The soybean is better able to forage for its nutrients than most other crops—nutrients the other crops were unable to get.

3. It frequently requires an additional operation to place fertilizer so it is not in contact with the soybean seed.

However, soybeans respond equally as well as other crops to everything done to raise the general productivity of the soil, and on some soils direct applications of fertilizer to soybeans may be quite profitable. Purdue reports excellent increases in the yield of soybeans when fertilizer was applied on potash deficient soils. Illinois reports similar results. Experiments in other states show marked increases in yields resulting from applications of lime, phosphate and potash on soils deficient in these elements.

On the better soils of Ohio it is generally best to determine the fertilizer needs of the entire rotation and then put the fertilizer on the other crops, particularly the small grain and clover crops rather than to apply it to the soybeans. But this leaves a lot of soybeans that are grown on land of less than average fertility with little or no manure or clover. Applications of fertilizer, and lime if needed, will often pay well when properly applied to the soybean crop on much of this kind of land.

Wild Statement No. 6: Soybeans don't fit into the rotation.

Soybeans have helped solve rotation problems on many Midwest farms. There are several reasons why the soybean is so well suited to the Cornbelt cropping system.

1. Its inherent ability to use plant nutrients other crops in the rotation are unable to get.

2. It is useful in corn borer control.

3. Being a legume it does not lower the soil nitrogen supply like the non-legume crops.

4. It provides a good seedbed for small grains with minimum of preparation.

5. It usually exerts a beneficial effect on other crops in the rotation.

6. Early varieties permit early harvest and the planting of wheat or other winter cover crops to help prevent erosion.

7. It meets a definite economic need for protein supplement and vegetable oil provided by no other crop.

8. It is a cash crop generally marketed between small grain and corn.

9. It has offered a ready means in the past of adjusting surplus grain acreage. It will help ease acreage adjustments in the future.

10. It is the best pinch-hitter on the farm team. In addition to its usual place between corn and small grain, it is "put in" when the clover crop fails, when something happens

to the corn stand, as an emergency hay and feed crop, and when it is too late to plant other crops.

Farmers must reckon the returns from the rotation as a whole, and the more profitable crops must carry the less profitable ones required in a good rotation. Corn and soybeans, the main cash crops in the Cornbelt, must help carry the oats and wheat crops and the legume crops grown for soil improvement. Both groups are less profitable than corn and soybeans, but they are necessary to maintain the productivity of the soil, and to make the rotation profitable in the long run.



—Photo by Soybean Digest

Processors of three states talk it over at the Urbana meeting. Left to right, Jasper Giovanni, Decatur Soy Products Co., Decatur, Ill.; Clarence E. Peters, Haynes Soy Products, Inc., Portland, Ind.; and Floyd E. Hiegel, Delphos Grain & Soya Products Co., Delphos, Ohio.

ILLINOIS, INDIANA, OHIO

Processors Meet

About 150 soybean processors, scientists and farm managers from nine states took part in the annual processor conference at Urbana, Ill., March 29 and 30.

States represented were Illinois, Kentucky, Indiana, Ohio, Maryland, Missouri, Georgia, Alabama and North Carolina. The annual conference, put on jointly by Illinois, Purdue and Ohio State Universities in cooperation with the processors of those states, will go to Columbus next year.

The group toured the greenhouses of the University of Illinois and the U. S. Regional Soybean Laboratory,

then held an evening session to hear reports on business conditions and the University's new department of food technology.

The second day's program included reports on the fats and oils outlook, research on growing soybeans, buying them, storing them and soybeans in animal and human nutrition.

Chairmen of the sessions included R. G. Houghtlin, president of the National Soybean Processors Association, Chicago; W. L. Burlison, head of the department of agronomy, University of Illinois; and J. W. Calland, managing director of

the National Soybean Crop Improvement Council, Decatur, Ind.

Dean H. R. Bowen of the University of Illinois College of Commerce told the processors that enough cushions have been provided to keep the next depression from being as deep as the last one.

Reasons to expect another depression will be leveled off, as Dean Bowen saw them:

I—The knowledge that a government can stop a depression dead in its tracks if it will spend enough money. Our government demonstrated this during the last war, and so did Hitler in Germany before the war started. "It would be difficult to

Bowen admitted.

L. B. Howard, head of the new University of Illinois food technology department, described the courses being developed there which will offer a bachelor of science degree, and eventually graduate work.

"Students will receive basic training in chemistry, microbiology, physics, mathematics, biology, economics and specialized work in aspects of engineering related to food processing, raw material characteristics, methods of processing and preservation and procedures for evaluation of processed products," Howard said.

The research program will in-

smaller quantities throughout the year rather than buying the bulk of the crop at harvest time, said D. W. McMillen, Jr., Central Soya Co., Inc., Fort Wayne, Ind. McMillen said hedging problems of the larger processors are greatly complicated by having to buy so large a part of the year's supplies at one time, which is made necessary by the present marketing system.

"There is no such thing as a sure-fire hedge," said McMillen. All hedging procedures have some risk, some greater than others.

Pigs fed vitamin B-12 in a ration including soybean oil meal averaged 41 pounds more gain per animal in the same length of time than pigs without the vitamins, said W. M. Beeson of the animal husbandry department, Purdue University.

He said only 1 milligram of vitamin B-12 per 100 pounds of feed was needed to produce the additional gain in the vitamin-fed lot. Beeson's subject was "Soybean Oil Meal in Animal Nutrition."

Other speakers included: Dean H. P. Rusk, dean of the University of Illinois College of Agriculture; G. L. Prichard, director fats and oils branch, Production and Marketing Administration, U. S. Department of Agriculture, Washington, D. C.; J. E. Newman, department of agronomy, Ohio State University, Columbus; C. T. Langford, Northern Regional Research Laboratory, Peoria, Ill.; A. L. Lang and A. R. Hilst, department of agronomy, University of Illinois; H. J. Mederski, Douglas J. Lathwell and Chester E. Evans, agronomy department, Ohio Agricultural Experiment Station, Wooster; and Calland.

Report of the talk by Hilst is carried in the "Growers" section of this issue. Others will appear in future issues.

— s b d —

MEDICAL FOOD

Protoban is a medical food combining whole proteins derived from skim milk powder, iron, carbohydrate, lactalbumin, ripe banana powder and a processed soybean, reports *Pharmacy International*, New York City.

Protoban is indicated in medical, obstetrical and surgical conditions in which an increased oral intake of proteins or amino acids is necessary. This includes patients with ulcers, chronic diarrhea, sprue, cirrhosis of the liver, hepatitis, anemia and diabetes.

Literature is available from the manufacturers, the U. S. Vitamin Corp., New York 17, N. Y.



—Photo by Soybean Digest

Interest in soybeans is hot in Alabama and Georgia as these three men testified at Urbana. They are, left to right: J. P. George, Macon, Ga.; W. P. Lanier, Atlanta, Ga.; and J. A. Bates, Selma, Ala. All work for Buckeye Cotton Oil Co.

tell the public that nothing could be done about a depression."

2—The sheer size of the government, which will employ a considerable share of the people even in leprosy.

3—A stronger banking system, farm price supports and organized labor which will keep wages up.

Bowen said he was not advocating any course of action but merely "reporting facts." He was besieged with questions before he could sit down, and one man asked from the floor if huge government spending would not merely postpone the day of reckoning.

Complete currency debasement is at least a strong eventual possibility.



L. B. HOWARD

volve both fundamental and applied problems. Processing research will involve formulation of new products from our fruits and vegetables, cereal grain, meats and oil-seeds such as soybeans and their products.

"In some phases of research we shall let our imaginations operate freely in the exploration of antibiotics, ultrasonics and even high speed electrons as means of devising new methods of food preservation and processing."

The corn crib may be on its way out, said L. E. Holman, agricultural engineer of the U. S. Department of Agriculture at Urbana. The next step may be picker shellers that will deliver shelled corn direct to dryers and then to bins for shelled corn. Then individual bins supported on their own foundations will be more economical and will supplant the old fashioned corncrib.

All soybeans processors would like to be able to buy soybeans in

Alcoholic Extraction

OF OIL FROM SOYBEANS

By ARTHUR C. BECKEL¹

Northern Regional Res. Laboratory
Peoria, Illinois

THE DEVELOPMENT of a process at the Northern Regional Research Laboratory for the extraction of soybean oil with ethyl alcohol (grain alcohol) as a solvent stemmed from the original conviction of Dr. A. K. Smith, in charge of the protein section, that the influence of the solvent on both oil and meal is of considerable importance. This concern of the protein section arises from the fact that isolated soybean protein finds many industrial uses where the color standard is dictated by casein from milk. Casein is a light-colored product and as such has had a slight advantage over protein isolated from hexane flakes. Dr. Smith was convinced that the "off color" of the soybean protein was not due to the protein itself but to coloring matter derived from the flaked beans. It seemed possible that the proper choice of solvent for oil extraction might assist in the solution of the problem.

It was evident from the literature that no systematic study of the effect of the solvent had ever been carried out. As a result, a study of the effects of certain solvents was undertaken. The solvents investigated were: carbon tetrachloride, trichloroethylene, ethylene dichloride; isobutyl alcohol, isopropyl alcohol, ethyl alcohol, and hexane. It was found that the solvents as such probably do not alter the oil or protein significantly, but they produce effects on the products because of dissolution of minor constituents of the bean which accompany the oil or, conversely, are left in the meal to interfere with the uses to which those products are put.

It developed from the study of the influence of the several solvents that ethyl alcohol (ordinary "drinking" alcohol — denatured, incidentally) produced lighter colored meal than any other solvent; further, it was possible to produce the lightest colored isolated protein from this meal. Then

it was discovered that this alcohol-extracted meal contained less of the beany and bitter principles present in the bean than any of the other meals; furthermore, the oil needed less refining because the free fatty acid content was less than one-fifth that of the usual commercial oil and the amount of "break" material to be removed by water washing was very low.

Good Solvent

There is a very interesting reason why ethyl alcohol produces these effects. These nonoil and nonprotein materials, which also include sterols, saponins, other bitter principles, and coloring matter, all exist in the plant itself largely in the form of glucosides. A glucoside is a combination of a substance with a sugar-like material. These combinations are soluble or dispersible in water and thus are carried in the sap. Ethyl alcohol is the best solvent for these substances and also is a good solvent for the oil. Wood alcohol is a fine solvent for these undesirables but has very poor oil-dissolving properties. Isopropyl alcohol is a better oil solvent than ethyl alcohol but is not as good for removing the impurities from the meal, particularly the bad-tasting materials. Therefore, it appeared most profitable to study the use of ethyl alcohol for the extraction of soybean oil.

I shall not spend much time on the historical aspect of the use of ethyl alcohol but shall proceed shortly with a description of the process developed at the Northern Laboratory. It will suffice to say that the Japanese had developed a batch-alcohol process to a semi-commercial scale and that the Germans had several processes which involved the addition of varying amounts of other solvents to the alcohol. All of these investigators had recognized the superior quality of the products resulting when ethyl alcohol is used as solvent but none of them had developed a process which could compete economically with the hexane-extraction process.

The fact that the use of ethyl alcohol as a solvent can produce an improved oil and at the same time an improved meal may be made somewhat clearer by the accompanying diagram which shows the solubility of the oil in alco-

hol at various temperatures. The vertical distance represents the solubility of the oil, the horizontal distance represents the temperature. The upper curved line shows the solubility of soybean oil in absolute alcohol at the various temperatures. Since the dotted line represents the boiling point of the alcohol, it is evident that before the boiling point is reached the oil is completely soluble in alcohol in all proportions. Applying this information to the use of this type of alcohol in the extraction of soybean oil it may be seen that if the extraction is carried out at or near the boiling point, the oil in the flakes will be almost completely dissolved. If the resulting solution is removed from the flaked meal at this temperature and allowed to cool in a separate vessel, the decrease in temperature and the decrease in the solubility of the oil will cause the major portion of the oil to separate from the alcohol solution. In fact,

• The alcohol extraction process perfected by the Northern Regional Research Laboratory produces superior products and also a whole series of new products. It is a safer process as well, according to the author.

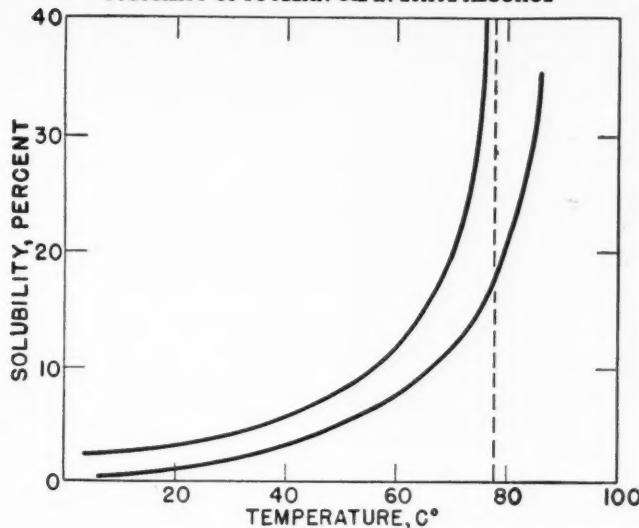
ARTHUR C. BECKEL



¹Presented at Cooperative Soybean Oil Mills Conference, Northern Regional Research Laboratory, May 25-27, 1948.

²One of the Laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.

SOLUBILITY OF SOYBEAN OIL IN ETHYL ALCOHOL



if the cooling is allowed to go to room temperature, the percentage of oil left in the alcohol will be about 3 percent. The other materials dissolved from the flaked bean by the alcohol do not have this same solubility-temperature relationship and, therefore, they remain in the alcohol.

Improved Meal

At this point the net result has been the removal of the oil and impurities from the soybean, leaving an improved meal, and the separation of a relatively pure oil from the alcohol solution. This is the point to which I referred previously when pointing out that both an improved flake and an improved oil could be produced at the same time by the one solvent, alcohol. The same situation exists when 95 percent alcohol is used, as is shown in the lower curve in the diagram. To obtain high solubility it is necessary when this alcohol is used to heat the solvent above the boiling point at atmospheric pressure. This is accomplished by carrying out the process under a small amount of pressure (15 pounds is sufficient). The separation of the hot solution from the flakes must also be carried out under pressure.

It may also be noted from the diagram that on cooling to room temperature the 95 percent alcohol retains less oil than does the absolute alcohol. The information up to this point has been known for a long time, and was the starting point for the investiga-

tions at this Laboratory. Now, if the recovery of the oil and the recovery of solvent alcohol was to be carried out in the same way that hexane is recovered in the usual extraction process—that is, by distillation—it would be necessary to use 2½ times as much heat energy to distil the alcohol as is required to distil hexane. Furthermore, when the alcohol containing the nonoil solubles is distilled a dark caramelized tar-like material is formed which adheres to the sides of the still and is difficult to remove. This also causes a loss of substances which may be of considerable value. Such a process is decidedly uneconomical.

Then came our discovery that it is possible to devise a process in which no distillation is necessary. We found that if the alcoholic solution remaining after the separation of the oil is cooled a further small amount, a considerable portion of the non-oil solubles separate in a semi-solid condition. There is left a brilliantly clear alcohol which contains between 4 and 5 percent of soluble material. This content is dependent on the temperature reached in the second cooling stage. (Cold water at 55° to 60° F. is sufficient).

One more step is necessary to complete the nondistillation process. This is the prevention of absorption of water from the soybean flakes by the alcohol. It is accomplished through the simple procedure of drying the flakes to 3 percent moisture or less before solvent extraction. It had been found that flakes of this moisture con-

tent did not lose water to the alcohol, but in the course of the usual process usually removed water from the alcohol leaving it a better solvent than when first used. We have carried out these steps just outlined and have reused the alcohol 85 times without ever having to distil it. As we have just said, the alcohol was a better oil solvent at that time than it was at the beginning of the experiment. The oil content of the flakes was always reduced to less than 1 percent, and the amount of semi-solid material obtained in the second cooling amounted to about 2½ percent of the original bean.

To recapitulate: The steps required after the usual soybean flake preparation are: (1) drying to less than 3 percent moisture, (2) extraction with hot alcoholic solution recirculated from step 4, (3) cooling of separated extract, (4) recirculation of alcohol to step 2, (5) desolvengizing of extracted flake and (6) removal of residual alcohol from oil. This is, of course, an outline of the process and I do not wish to imply that the simplicity indicates any decrease in the technical skill required in any other solvent-extraction process.

Careful material and energy balances have shown that, on a theoretical basis, the cost in energy of this alcoholic extraction is three-fourths that of the hexane process. Practical design considerations indicate the cost of operation to be about the same as for the hexane process.

The alcoholic-extraction process is safer, the products are better, there is a large series of new products, and alcohol is also a derived agricultural product.

— s b d —

AGAINST FREE STORAGE

Minnesota elevator directors are in favor of eliminating the 15 days' free storage provided by law at a vote of 71.5 to 28.5 percent.

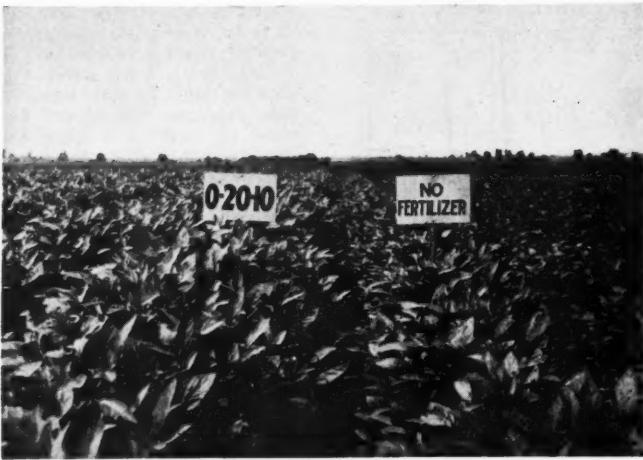
The survey was undertaken by the Farmers Elevator Association of Minnesota by a mailed questionnaire. Two questions were asked:

"Is your board in favor of eliminating the 15 days free storage as now provided by law?"

"Is your board in favor of a revision of storage charges so as to be more in line with present costs of handling grain and erection of buildings?"

On the second question, more than 85 percent were in favor of adjusted rates on storage charges.

One suggested that rates on soybeans and flax should be 2 cents a bushel a month, wheat and rye 1½ cents, and barley, 1 cent.



Effects of fertilizers on growth of soybeans on gray prairie soil. Unfertilized 19.6 bu. per acre. Fertilized with 200 lbs. 0-20-10 26 bu. per acre. Both well supplied with lime.

FERTILIZING FOR SOYBEANS

By ARNOLD W. KLEMME

Extension Professor of Soils
University of Missouri

HIGH ACRE YIELDS and quality of soybeans usually go together and give the grower the greatest profit. The cost of preparing the seed bed, of seed, and other overhead costs is approximately the same for low acre yields as for high acre yields. The margin of profit is in the extra bushels of seed per acre. High acre yields of this crop are usually obtained on soils highly fertile, or where the soil fertility has been brought to a high level by soil treatments.

Limited Root Surface

The soybean has only about one-sixth as much root surface in contact with the soil as the oat plant; one-thirteenth as much as winter rye; and one-thirteenth as much as bluegrass. Consequently, unless the soil is high enough in fertility to quickly replenish the supply of soil fertility as rapidly as the soybean roots remove it in their limited feeding zone, satisfactory growth and yields will not be obtained.

Fertility Limits Yields

Some of the soils along the Missouri and Mississippi Rivers, naturally high in mineral plant foods, are able to supply sufficient mineral

plant food for high acre yields. It is on these soils that highest acre yields are obtained year in and year out. On the other hand, on most upland soils especially the gray prairie soils in Missouri, one of the chief factors limiting higher acre yields is the low fertility level of the soil. Attention must be given to this important factor if satisfactory yields of seed are obtained year in and year out.

Plant Foods Needed

The soybean draws heavily on the soil for calcium, phosphate and potash. As previously mentioned, soils naturally well supplied with these plant foods along with organic matter, usually give high acre yields. On much of the area where soybeans are grown in northeast and southwest Missouri prairies, the soils are extremely deficient in lime, phosphorous and frequently potash as well. The most deficient plant food limits yields—this may be calcium, phosphate, or potash. After one deficiency is corrected another may become the limiting factor.

Use of Soil Tests

The amount and kinds of plant food needed can best be determined by soil tests. Facilities are available in Missouri for testing the soil in 50 modern county soil testing laboratories in or near the county agent's office. At any county agent's office,

instructions for taking soil samples can be obtained as well as arrangements made for having soil samples tested.

Limestone Pays

Unless limestone has recently been applied, it is usually the first treatment to be applied on lime deficient soils. In addition to furnishing lime or calcium for the plant, the limestone also corrects the acidity of the soil and increases the efficiency of the soybean bacteria in helping the soybean plant get atmospheric nitrogen. It also apparently increases the availability of other soil nutrients, especially phosphorous. The amount of lime to apply can be determined by a soil test. The county agent is equipped to make soil tests for limestone and make recommendations for its use.

In three carefully conducted tests with soybeans on lime deficient soils conducted during the period 1942 to 1944 on adjacent limed and unlimed plots and where the limestone had been applied 3 or more years before the crop was planted, the yields were increased from 4.1 bushels to 7.4 bushels per acre.

On the clay pan soils in Audrain County typical of the northeast Missouri prairies where lime alone was used in comparison with no lime over the 3-year period 1943-1945 on 12 crops, acre yields were increased about 4 bushels per acre.

The consistent response to lime on acid soils is generally recognized by farmers. For example, in 1943 only two of the twenty-two farmers enrolled in the Soybean Production Program in the above county grew their crop on unlimed soil. These yields were 7 bushels under the average of the group.

Raises Protein Content

In addition to increasing the yield, limestone also raised the protein content of soybean seed. On a gray prairie soil where limestone increased the yield of soybean seed 7.4 bushels per acre, the protein content of the soybean seed was raised from

- Dr. Klemme's recommendations apply to Missouri where fertilizers have been paying good dividends to soybean growers. Fertilizing practices in other states were described in our April issue.

37 percent on the unlimed plots to 39.75 percent on the limed plots.

The oil content of the soybean was slightly higher on the unlimed plots than on the limed plots, being 21.76 percent on the former and 20.6 percent on the latter.

Small Applications

Even small amounts of plant food plowed under directly ahead of a soybean crop can be expected to give significant increase in yields on poor soils. During 1944 and 1945 in seven tests soybean yields were increased from 18.3 to 23.5 bushels per acre or 5.2 bushels per acre where even less than 200 pounds per acre of complete fertilizer was plowed under.

Heavy Applications

Full crops of soybean seed as well as other crops year in and year out can be obtained through the use of a permanent soil improvement program which removes plant food deficiencies of the soil. After the soil fertility has been brought to a high level, small applications of plant food can be used for maintenance. It can be applied to other crops in the rotation such as corn and small grain ahead of clover. Soybeans being grown in rotation with clovers or clover and grasses will not need additional fertilizer but will be able to get sufficient plant food from the soil reserves.

The mineral plant food deficiencies can be eliminated through heavy initial applications. These applications can be applied any time machinery can be driven over the field. They may be applied directly ahead of a soybean, corn, or small grain crop where new seedlings are to be made and placed in the soil in the regular cultural operations.

Such a program is an investment in soil fertility which may or may not pay its entire costs in a single crop. Frequently this does occur. In 1943 on a very deficient phosphate soil where 1,000 pounds of rock phosphate was applied ahead of soybeans, an increase of 5 bushels of soybeans per acre was obtained which nearly paid the cost of treatment the first year. The phosphate deficiency on this soil was corrected for 8 to 10 or more years.

Split Applications

When heavy initial applications of fertilizers cannot be used the so-called "split" applications may be used. For example where the soil test indicates that 800 pounds of 20 percent superphosphate or 350 pounds of 45

percent phosphate is needed, half of this application may be made initially. Then by repeating this application ahead of each crop in the rotation for several rounds in the rotation, the phosphate levels can be built to a high level and phosphate removed as a limiting factor to crop yields and quality. If potash is needed a phosphate-potash fertilizer or phosphate and potash materials could be used.

With either of these methods of soil treatments, soybeans can be grown in systematic crop rotations with clovers or clover and grass.

Results obtained in 1944 on seven different farms in northeast Missouri, showed the practicability of this program. An average yield of 33.1 bushels per acre was obtained where soil treatments had been used for several years and the soybeans had been grown in systematic crop rotations, immediately after or within 1 year of clovers or grass sod.

On five farms where fertilizer was plowed down ahead of planting and no other legumes were used in the rotation, the average yield of soybeans was 24.4 bushels per acre as compared to 18.4 bushels on untreated land.

Frank Brakel, a veteran soybean grower of Laddonia, Audrain County, who plants his crop after lespedeza or clover on limed land and uses mineral plant food liberally, obtained an average yield of 20 bushels per acre in 1947, an unfavorable growing season for soybeans. The average yield of his variety was about 11 bushels for that year. In 1948, the average yield for his 115-acre crop was 35 bushels.

Raymond Roberts of Cairo, Randolph County, who uses a rotation of corn-soybeans, small grain and sweet clover and uses mineral plant food in accord with the soil test gets similar results.

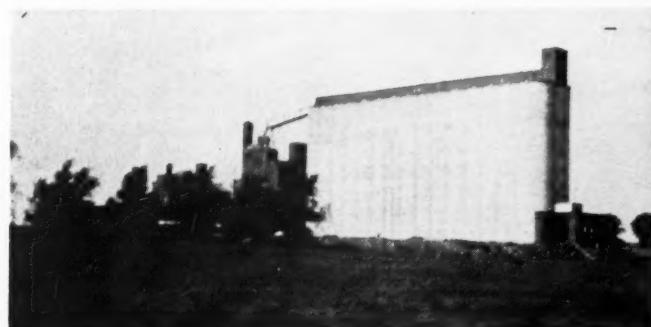
Erosion Problems

The use of clovers in the rotation, especially sweet clover, along with the return of corn stalks and straw, will provide a high turnover of organic matter and nitrogen. This, along with liberal applications of fertilizers, will provide ample fertility for high acre yields of all crops in the rotation. However, unless this plan is followed, the frequent cultivation required, plus failure to return the organic matter destroyed by cropping and to provide cover on the land immediately preceding and after the crop of soybeans, will permit severe erosion, encourage leaching of fertility and bring on rapid depletion of soil fertility.

These facts are substantiated by results obtained at the McCredie Experiment Station in Callaway County. During the period 1941 to 1945 inclusive, the annual soil loss from erosion was but 2.73 tons per acre where soybeans followed a grass sod. On an adjacent area where soybeans were grown after corn in a corn, soybean, wheat, lespedeza rotation, the annual soil loss was 10.4 tons per acre.

The soybean has been grown long enough by Missouri farmers for them to add their own convictions that the crop has certain requirements which need to be met if it is to synthesize the protein-rich, oil-heavy seed in bounteous yields.

Redfield, Iowa, Mill



—Photo by David Pellett

Iowa Soya Co. plant at Redfield, Iowa. The firm operates a solvent extraction unit and has storage capacity for 1,050,000 bushels of soybeans. H. R. Straight is president.

ORIENTAL USES OF SOYBEANS AS FOOD



A miso plant in Tokyo. The large tubs in foreground are used for the fermentation of the miso. A part of the plant was destroyed during the war. (August 1948)

By ALLAN K. SMITH

Northern Regional Research Laboratory¹ Peoria, Ill.

Photos by the Author

IV. JAPAN

wheat, and sweetpotatoes. This de-emphasis on soybean breeding work was due to Japan's access to Manchuria as a source of soybeans. Yearly importations were in excess of more than 900,000 metric tons (33 million bushels). Home production of soybeans before the war was 300,000 to 350,000 metric tons (11 to 12.8 million bushels). Present production is about 230,000 metric tons, an amount the Japanese hope to increase to near prewar quantities. Average yields per acre have also dropped in recent years, probably due to shifting soybean culture to less fertile land areas.

The difficulty of increasing production at present is the unfavorable price ratio of soybeans to that of rice and sweetpotatoes per unit area of farm land.

That high yields of soybeans are possible in Japan is illustrated by results in a yield contest sponsored by the government. The prize-winning yield was 4.2 koku per tan. This is a yield of 88 bushels per acre. The winner of the contest grew his beans in a so-called mountainous region; however, it was the opinion of the official reporting the data that the area was not very high above sea level, perhaps 300 meters. The average yield of soybeans in Japan in one report is given as .881 metric tons per acre (12.9 bu.) while in another report as 0.71 koku per tan (14 bu. per acre).

While soybeans are grown throughout Japan, Hokkaido is the largest soybean producing area. Here the beans are planted in May and harvested in September. Soybeans that are taken from Hokkaido to southern localities usually mature much earlier than in their native

With Attention to Fermented Products. Notes on Oriental Farming Practices.

AGRICULTURE always has been the leading industry in Japan. It provided employment for more than 40 percent of the population before World War II and supplied about 85 percent of the nation's food supply. The remainder of the Japanese food requirements was made up largely with soybeans from Manchuria, rice from Korea, and sugar from Formosa. The loss of her colonies and the destruction of many of her home industries as a result of the war has intensified the importance of agriculture to Japan.

To help visualize the Japanese situation, we might turn to the report of the National Resources Section (NRS) of the Supreme Command for the Allied Powers (SCAP). In a section dealing with the "Outlook for Japanese Agriculture" it is stated that "approximately 30 million persons will have to maintain themselves in 1950 on a comparatively small land area, about equal in size to Montana, that is basically poor in natural resources." In fact, only 16 percent (about 15 million acres) of the land area of the Japanese islands is arable. Prior to the war the Japanese people were living on a daily intake of about 2,150 calories. Im-

mediately after the war their food production dropped to provide a ration of probably less than 1,600 calories per person; however, with outside help it is presently estimated at about 1,850 calories. To appreciate fully the position of Japan it is also pointed out in the above report that further increases in Japanese crop production will be small, and it is indirectly indicated that the increase in population and corresponding food requirements will grow more rapidly than her agricultural production. Under such conditions, Japan must develop industries and foreign trade in order to obtain her food requirements.

The Japanese are very aggressive in their agricultural research program; in fact, Japan's zeal for agronomic research, as reported by SCAP, has led to the establishment of more than 600 experiment stations. Many of these stations are very small, and under the present guidance of SCAP officials it is expected the number will be reduced through consolidation of experiment station work.

Prior to the war, agronomic work on soybeans was given less attention than that on other crops such as rice,

¹One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture. Report of a study made under the Research and Marketing Act of 1946.



Tubs of miso ready for shipment. Because of the present shortage of soybeans in Japan they dilute the miso with an equal amount of pickled sweetpotatoes. (August 1948)

habitat, especially during the first year. In the second year a variety will extend its growing season 7 to 16 days beyond that of the first year. While many of the northern varieties cannot be successfully grown farther south, some selected varieties have proved unusually successful.

The Japanese make a general classification of their soybean varieties into early, medium, and late maturing types. The early and very late maturing varieties have the advantage of avoiding the insect damage to which the others are subject. The early maturing varieties are used almost entirely as food, with many of them classed among the so-called vegetable types.

To obtain soybeans very early in the season, planting is done in beds and the seedlings transplanted early in April. The crop is harvested in late June or early July. In some localities even the transplanting of field varieties has attained some popularity. The practice of transplanting soybean seedlings has been copied probably after the custom of transplanting rice. This practice saves about 3 weeks of the time the crop occupies the field and has made the practice of double cropping possible in areas farther north than would be possible otherwise. It is Japanese experience that soybeans grown in a normal manner on very rich soil do not yield well, although if the seedlings are transplanted on

rich soil they will make an excellent yield.

Other oilseed crops of Japan are sesame, peanuts, rape, castor beans, and flax. In wartime, the Japanese grew some sunflower. A small quantity of oil from the Abura Kire or oil tree is processed also. This is the same as the tallow tree of China and gives the same products.

Production of Miso

The miso of Japan is the same as the soy paste of China; however, the relative importance of the product in the two countries is not the same. In China soy paste production is small in comparison with the production of soy sauce, whereas in Japan the miso is of greater importance than the sauce. Miso is used so extensively in parts of Japan that its caloric value is included in the food rationing program established by SCAP and in some localities it furnishes 25 percent of the protein requirements. Miso has a flavor like soy sauce; it is made similarly to soy sauce except that less water is used in fermentation and the entire product is eaten rather than the filtered liquid.

Miso production starts with two parts of soybeans and one part of wheat, rice or other starchy grain. The finished product analyzes 15 percent protein and about 12 percent salt on a 50-percent-moisture basis. However, some producers are attempting to reduce the salt content to as low as 6 percent.

The largest single use for Miso in Japan is in soup—many Japanese eat

soup three times a day. Miso is also a spread for bread in the same way Americans use butter, and on cucumbers or other raw vegetables as an added flavor. Along with sugar and oil it is used in cooking fish, meat and vegetables. Although manufacturers seldom add condiments to miso, it is a common practice for the housewife or cook to add condiments at the kitchen stage of food preparation.

The Japanese produce three kinds of miso which are known as white, red and black. Different starting materials are used for each of the three different kinds. White miso, the sweetest variety, is made with soybeans and rice and contains less salt than the other two types. It also is made with more koji than is the red miso. The time required for making white miso will vary from 1 week to 1 month. This product is consumed mostly around Kyoto, Kobe, and Tokyo.

Red miso is made with soybeans combined with either rice, wheat or barley but contains more salt and a larger ratio of soybean to starchy material than does the white miso. Red miso is consumed throughout the islands of Japan. In addition to the uses mentioned above, the red miso is used in preserving vegetables such as egg plant, burdock root and melons.

Black miso is made entirely from soybeans. It has a flavor resembling soy sauce. Producers claim that it requires 1 to 3 years to make the good and best grades of black miso; however, due to the shortage of food



Tubs of ajinomoto (monosodium glutamate) ready for shipment at a plant located between Tokyo and Yokohama, Japan. This plant had a maximum production of 7.5 million pounds in 1937. (August 1948)

since the war, it is now being turned out within 2 to 3 months. One of the special uses for black miso is for making a special type of oyster soup. Black miso is made and consumed mostly in the prefecture of Nagoya.

As indicated, the whole soybean is normally used in making miso, but since Japan is short of soybeans she is forced to use soybean cake and soy flour imported from the United States.

While the Oriental countries use soybeans extensively in various forms

as food, they are not familiar with American type soy flour and shipments of soy flour to Japan created new problems for them. The difficulty was further aggravated by poor storage conditions which degraded the flour and made it still less acceptable to the people. The miso producers, under pressure from the SCAP officials, were finally induced to try it in their product. The early results indicated that use of soy flour in miso production gave satisfactory results. In fact, the only evident problem in using soy flour was that of increasing its moisture content sufficiently for the steaming operation.

In miso production the soybeans, soy cake, or soy flour is steamed before mixing with the cereal grain. The soy flour is the least desirable of the starting materials because it is difficult to wet. The koji (fermenting organisms, the principal one being *Aspergillus oryzae*) for miso is prepared on steamed rice or barley, the whole kernel being used. Koji preparation is carried out in a special room in the basement of the plant; the heat from the fermentation reaction keeps the room warm and the basement location helps to maintain a high humidity.

In the fermentation process the soybeans, soy flour, or cake is mixed with the mold organism in a rectangular box by hand shoveling and the mixture is allowed to stand in the box overnight. It is then placed on small wooden trays along the walls of the fermenting room for about 24 hours. At the end of this period the fermentation has proceeded far enough. To this mixture an equal amount of fresh raw materials is added, and after the addition of salt it is placed in large, wooden vats (approximately 5,000 gallons) for further fermentation and enzyme action. The vats are covered with heavy mats and the reaction allowed to proceed for about 3 months. The rate of fermentation of the various raw materials was reported to be the same.

Because of the shortage of soybeans in Japan, miso is being extended with an equal quantity of sweet-potatoes. Sweetpotatoes used for this purpose are cooked and pickled in salt and mixed with the miso just prior to packing it in wooden tubs for shipment.

Soy Sauce in Japan

The importance of soy sauce to Japan is well illustrated by the Noda Mati plant of the Kikkoman Shoyu Co., Ltd., which was founded in

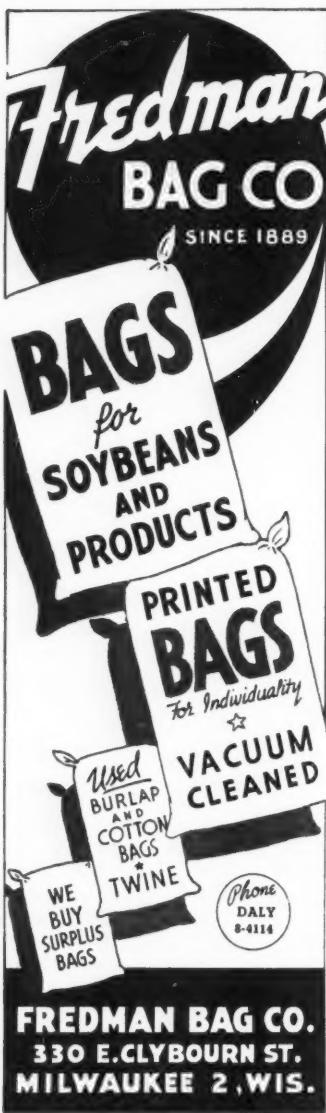
1764. This is the largest soy sauce plant in Japan and probably the largest in the world for making a fermented type soy sauce.

The annual production of shoyu at Noda has been as much as 23 million gallons, consuming 30,000 metric tons (11 million bushels) of soybeans, 27,000 metric tons of wheat, and 29,000 metric tons of salt. The Noda city factory includes 8 brewing plants, 1 bottling plant, 1 barreling plant, 6 auxiliary plants for construction of barrels and other materials used in their process, and a research laboratory with a staff of more than 30 workers. The factories of the Noda city plant are spread over 2,333 acres of land. It is claimed that the general occurrence, throughout the small city, of the mold used in fermenting shoyu suppresses other bacterial life and maintains a high health standard for the city.

The preferred raw materials at this plant for making shoyu are soybeans and wheat, although at present soybean meal from the United States is being used. In their process the soybeans or soybean meal is steamed in large steel-jacketed vessels for about 12 hours. In the steaming process, the pressure is brought up slowly to 10 lbs./sq. in. where it is held for about 1 hour, then is allowed to drop very slowly to zero.

The steamed soybeans then are dumped on a cement floor and mixed with wheat which has been parched and cracked. This mixture is then inoculated with specially selected types of *Aspergillus oryzae* and placed in wooden trays about 14 by 24 inches in area and 4 inches deep. The trays are stacked in large fermentation rooms (12 by 50 feet) for about 72 hours. The heat of fermentation warms the material to 40° C. and it is held at approximately this temperature. The molded material is now mixed with salt water and placed in cement tanks for further action by microorganisms. This plant has 1,500 cement fermenting tanks, each holding 100 kohu (1 kohu = 47.65 gallons). During the summer and when fresh material is added, the tanks are stirred about 10 times per month, and in the winter less often. The stirring is performed by bubbling air into the bottom of the tanks. For a good grade of soy sauce the mash is fermented 8 to 12 months. Owing to the current pressing need for the sauce, the fermenting period now is often shortened to 3 months.

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shoyu from the Noda city plant was given as follows:

	Grams in each 100 ml.
Total solids	38.13
Total nitrogen	1.51
Albuminous nitrogen	0.69
Non-albuminous nitrogen	1.42
Amino nitrogen	0.70
Volatile acids (as acetic acid)	.14
Non-volatile acids (as lactic)	.65
Sugar (as glucose)	5.99
Dextrose	1.06
Mineral matter	19.70
Sodium chloride	18.02
Phosphoric acid (as P_2O_5)	0.48
Viscosity (Ostwald at 25° C.)	4.44
Hydrogen ion concentration—pH	4.6
Specific gravity at 15°C.	1.2000

Due to the shortage of raw materials, the standards for soy sauce have been reduced to about half of the above composition, except that the salt concentration is maintained at the same concentration.

Monosodium Glutamate

When Dr. K. Ikeda of Tokyo Imperial University was attempting, prior to 1908, to isolate from shoyu the constituents responsible for its good flavor, he discovered glutamic acid or its salt, monosodium glutamate (MSG), to be the principal flavoring constituent of soy sauce. Dr. Ikeda then devised a method for isolating glutamic acid from soybean hydrolysates and in 1908 obtained a Japanese patent on the process.

A pilot plant was built immediately for the making of MSG at Zushi, 20 miles southwest of Tokyo by S. Suzuki, a friend of Dr. Ikeda. The pilot-plant development was successful, and in 1914 a full-scale

plant was built at Kawasaki 8 miles south of Tokyo.

The trade name given their products was Ajinomoto, meaning "essence of taste" and the company is known as the Ajinomoto Co., Inc. The production of ajinomoto increased steadily to 40 tons per month until the earthquake of September 1, 1923, entirely destroyed the plant. The plant was immediately rebuilt and had attained a capacity of 50 tons per month by March 1924.

The maximum production of 3,750 tons was reached in 1937. After 1939, production decreased because of the war, and the plant was partially destroyed by bombing.

Since the war, the Ajinomoto Co., Inc., has recovered production to about 20 tons per month. There are about 30 plants in Japan producing MGS but they are all very small except that of the Ajinomoto Co., which manufactures about 90 percent of the total Japanese production.

The plant is operating at present on solvent-extracted soybean meal from the United States, although wheat gluten, if available, would be the preferred raw material. The first step in their process consists of extracting the meal at the isoelectric point of the protein (about pH 4.2). This removes soluble sugars and soluble nitrogen compounds, and thus raises the nitrogen content of the meal to about 10 percent. The meal is hydrolyzed with 17 percent hydrochloric acid at 30 lbs./sq. inch/steam pressure for 15 to 18 hours.

It was not possible to get a clear picture of their entire process because the company's equipment was widely scattered. According to their description, ajinomoto and chemical soy sauce are manufactured from the same raw materials. After the acid hydrolysis, the hydrolyzate is partly neutralized and a crop of glutamic acid crystals is removed. The remainder of the hydrolyzate is used in making chemical soy sauce.

Trends in Soy Sauce Production

The quality of soy sauce is determined by its taste and aroma. It is universally agreed by the Oriental people that the longer the brewing period in making soy sauce, the more pleasing the product. The early part of the brewing period develops the desired taste, after which aging develops the agreeable aroma.

Shortage of supplies and economic pressure are gradually inducing a change in the traditional methods of producing soy sauce in favor of



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When the war ended, these charges were no higher—and in many cases were lower—than when war began back in 1939. But prices and wages kept climbing until freight rates had to go up.

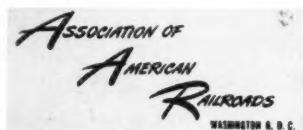
Railroad rates, though, went up later than other prices. By the time of the first small increase in freight rates, in the middle of 1946, the average level of other prices had already gone up more than 40 per

cent above 1939.

And freight rates have gone up less than the average percentage increase of other prices—in fact, only about half as much.

So railroad freight charges now represent an even smaller fraction of the prices you pay for the things you buy than they did before the war.

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shorter procedures. Producers frequently state that 2 to 3 years is required for making the best grade of soy sauce. It is evident, however, that in recent years they have seldom aged their product more than 8 to 9 months and much of it is now produced in 3 months.

The Chinese producers cling more tenaciously than the Japanese to the traditional method of aging their sauce. For example, the Chinese process still is carried out in 50-gallon earthenware crocks out in the open. Many Chinese insist that sunshine and even the moon are factors in developing good flavor. The only semi-modern plants in China were built by the Japanese during their occupation. One of these plants is at Peiping and another at Tientsen; both are operated by the respective municipal governments.

Chinese scientists are conscious of their problem and the pressing need for more efficient methods of shoyu production. The government is now supporting research on soy sauce at their National Bureau of Industrial Research Laboratory at 352 Chang-Ming Road under the direction of Dr. Pei-Sung King. Another branch of the same organization is at 1313 Szechun Road, N. Shanghai, where Dr. C. T. Siau directs the operation of a soy sauce pilot plant. They hope to reduce the production time without loss in flavor.

The fermentation procedures of the Chinese and Japanese are essentially the same, but the Japanese conduct their operations under cover of a building and have developed more modern equipment for handling their materials.

M. F. A. Mill at Mexico, Mo.



You see the soybean processing plant and storage bins of Missouri Farmers Association at Mexico, Mo. This firm is installing a new Anderson Expeller for the 1949 crop, in addition to the two now in operation. The firm has been obtaining 9.79 pounds oil from the soybeans crushed this season. Storage capacity is 300,000 bushels.

The newer methods which are competing for favor in Japan are (1) the chemical method, and (2) the mixed chemical and fermentation process. The first method is sponsored by the manufacturers of monosodium glutamate (MSG) because they can use much of their residues from MSG manufacture for their chemical soy sauce. The strictly chemical type sauce is lower in quality than that produced by older methods, but it represents a great saving in production costs, and the quality is still quite acceptable. The older school of brewers cling to the hope they can retain all the tradi-

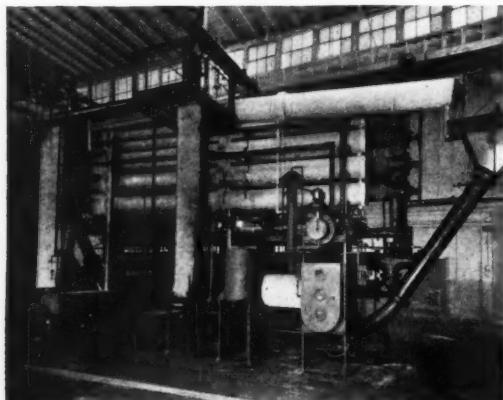
tional flavor and aroma. They are sponsoring a process (No. 2) in which the protein is partly hydrolyzed with acid, this being followed by neutralization and then fermentation for a period of about 30 days. It is quite possible that both methods will be used and that different standards of quality will be established.

A few plants were said to make a soy sauce product from miso and in Japan this kind of sauce is called Tamari.

(Final article by Dr. Smith based on his trip to Asia, will be in May.)

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BROKERS TO THE SOYBEAN PROCESSOR

AZLON NOT YET ON MARKET

No attempt has been made yet to market the improved soy fibre developed in the pilot plant and laboratory of the Drackett Co., Cincinnati. Roger Drackett, president, told stockholders in a message accompanying the annual report.

"We cannot say when Azlon textile fiber will be ready," he declared. There are still many problems unsolved that relate to measurement and control of variables of which there are many in a chemical process of this kind. Mr. Drackett pointed out.

"While the company has made a considerable investment in this project," he stated, "it is our judgment that we must proceed cautiously rather than risk a false start, which would jeopardize the product's future.

"If we exclude the fiscal year 1946-1947," Mr. Drackett said, "in which market conditions brought about an abnormal profit on soybean oil and meal, the fiscal year covered by this report produced the largest earnings of any year in the company's history.

"While sales increased during the past year, attention is called to the fact that changes in the dollar sales volume are largely the reflection of changes in the market price of soybean products. With soybean extraction plants operating above rated capacity, no important increases in sales tonnage can be expected until facilities are expanded. The firm has no such expansion plans," Mr. Drackett declared.

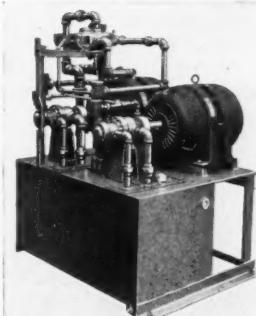
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KEWANEE MACHINERY & CONVEYOR CO., Kewanee, Illinois

GERMAN BUTCHERS SELL NEW SOY FOOD

Spurred by desire to overcome food shortages in Germany, a group of Allied and German scientists has produced and is ready to distribute two food substitutes that are said to taste and have the same nutritious qualities as milk and meat, it was disclosed at Frankfurt, Germany.

The new foods consist of combinations of protein extracts from such diverse sources as soybeans, peanuts, wood, yeast, wheat, corn and coal.

The milk produced by a new process has passed all tests successfully and even now is being distributed in German rations experimentally, said Gwynn Garnett, an official of the U. S. Military Government food and agriculture branch.

The new meat is actually a mixture of 50 percent ordinary meat and 50 percent vegetable proteins, prepared in the form of sausages, liver-wurst and salami. Garnett said this product probably would be put in the German ration in March.

He said that committees of housewives, meat processing experts, members of the bizonal economic council, bizonal food ministers, German food scientists and members of the American and British military governments participated in the final tasting tests and gave their approval.

A third synthetic food, a 100 percent vegetable protein, was rejected for the time being because it was not palatable enough. Garnett said that experiments to improve this product were still going on.

During the Easter holidays the first 20 carloads of soy meat flour for sausage production were on their way to hundreds of small German

butchers who handle 80 to 90 percent of the German meat and sausage business in that country, reports Dr. William Bening, Frankfurt.

"I doubt whether an American reader can imagine what additional allocations of soya, lard and spices mean to German butchers and consumers, since people here have been almost entirely deprived of lard and genuine spices for many years," says Dr. Bening. "That means more to this country than to any other because sausage is the most popular style of meat in Germany."

"Our carefully prepared sausage program has got an extraordinarily promising start by additional lard and spice allocations due to the energetic and broadminded sponsorship of Stanley Andrews and Gwynn Garnett, chief and assistant chief of the American-British food group in the Bi-Partite Control Office.

"I don't know of any comparable governmental action to assist in a soya program for human nutrition. When Andrews and Garnett agreed that the German nutrition is to be improved by an additional soya-lard-spices-supply, they have likewise started a pioneer action to broaden the market for American soybeans.

"Ersel Walley, president of the American Soybean Association, and Richard Brierley of Archer-Daniels-Midland Co., who studied the German economy on the spot during their nerve-straining trips through this country in 1948, have assisted greatly to create the solid basis for the program.

"The activity is based on an entirely new soya meat flour. It is made by a new additional refining

process from an entirely debittered and defatted soy flour and grits. A scientifically calculated percentage of isolated meat protein is added in course of production. Inventors are the Neger brothers, a butcher and a chemist.

"Not only well equipped meat packers' factories but every small butcher as well can use the material to produce delicate sausages of all types at half price."

— s b d —

NEW FLOURS BY STALEY

Production of two new types of soy flour made especially for the baking industry has been announced by A. E. Staley Manufacturing Co., Decatur, Ill.

In ordinary full fat or high fat soy flour only about two-thirds of the natural soy oil is readily available as a shortening agent, as the oil is "locked in" the cells of the flour. In the manufacture of the new flours for the baking trade, Staley production men first remove all the oil, refine it and blend the proper amount of it back into the flour in a fine spray. The soy oil is then free to mix readily with other ingredients and all of it becomes available as a shortening agent.

The two new flours are Powdered Soya-Lo-Fat, containing only about 4 percent soy oil—sufficient to prevent dustiness, and Powdered Soya-Hi-Fat, which contains about 14 percent soy oil.

The company has prepared a technical data sheet on the new flours. It can be obtained by writing to Richard L. Nagle, Industrial Department, A. E. Staley Manufacturing Co., Decatur 60, Ill.

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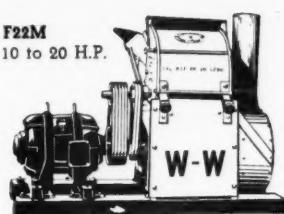
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RATED 3450 LBS.
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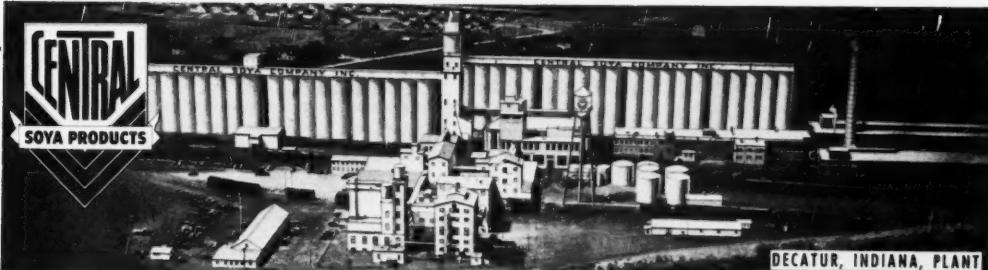
100 to 150 H.P.
Shaft 4 $\frac{3}{4}$ "

MAIN BEARINGS
RATED 3450 LBS.
AT 3600 R.P.M.
35" WIDE

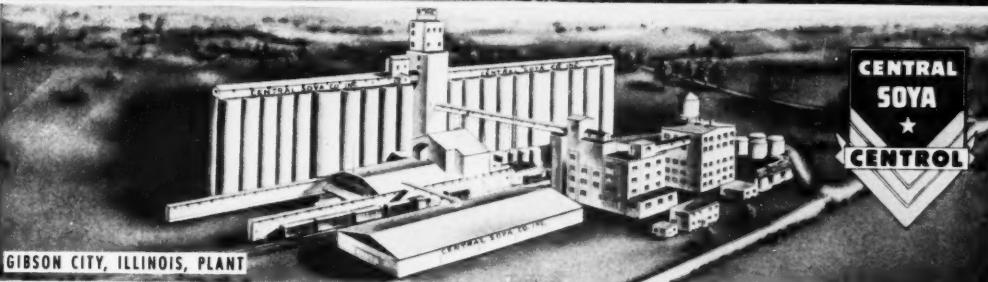
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Serving American Industry
THE CENTRAL SOYA COMPANY, INC.
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COLUMBUS PROGRAM TO RID PLANTS OF SMOKE, DUST

With more than 15 percent of all the soybeans grown in Ohio being marketed through their local plants, two sister companies, the Soy Extraction Corp., and the Continental Grain Co., Columbus, Ohio, have just completed an improvement program costing \$35,000.

The present program has been restricted to the elimination of smoke and dust, both inside and outside the plants. Other equipment at the mills, 1915 East Main St., is comparatively new, since the rebuilding after their predecessor company, the Gwinn Milling Co., was destroyed by fire. In that rebuilding modern improvements and safety devices were added.

Tackling the whole problem of smoke and dust, months of research and study by Battelle Memorial Institute engineers along with engineers from coal producers and equipment manufacturers preceded the present improvements.

Foremost in the installation of the new machinery was a Westinghouse, screw-type, underfeed stoker and an electronic automatic Hagan control

system for the efficient operation of the boilers.

This new stoker feeds a 375-horsepower steam boiler with 150 tons of Ohio coal each week. Its installation has eliminated smoke from the huge five-foot stack that rises 125 feet above the plant.

As an extra precaution against smoke, Donald H. Wilson, vice president and general manager of Soy Extraction Corp., has ordered an "electric eye" recorder installed for making a permanent record, 24 hours a day, of the amount of smoke going from the boilers into the stack. Importance of this equipment is its contribution toward placing of responsibility for any smoke that might be detected in the area.

In addition to the smoke elimination, two giant dust extractor cyclones have been installed atop the soy plant along with a Dustex, which collects dust through a series of 40 smaller cyclones.

Operation of the Continental grain elevators also has been improved with the recent installation of a \$15,000 dust-collecting system. The huge elevators, with a storage



Donald H. Wilson, right, vice president and general manager of Soy Extraction Corp., Columbus, Ohio, and his plant superintendent, Clark O'Neill, inspect the soybean flakes as they come out of this 10-ton Anderson flaking mill on their way to the extraction works. Approximately 8,300 pounds of beans go through this mill each hour.

capacity of 1,500,000 bushels, handle between 10 and 12 million bushels of grain each year. In addition to the million bushels of soybeans which are processed by Soy Extraction Corp. annually, Continental buys and ships 1½ to 2 million bushels of soybeans each year.

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FORMS NEW AGENCY

Following the recent decision of Central Sova Co. Inc., Fort Wayne, Ind., to discontinue the production and sale of soy albumen and soy flour, Ray Turner, sales manager of the products division for the past several years, announced the formation of a new sales agency to be known as Preferred Brands Co.

The Preferred Brands Co., located in the Currier-Lee Whse., Bldg., 461 West Erie St., Chicago 10, Ill., will specialize in the sale of basic food materials including soy products to the confectionery, biscuit, baking and other food manufacturing trades. They are representing established producers of these products.

Prior to joining the staff of Central Sova Co. Inc., Turner was manager of the powdered egg division, Armour & Co., Chicago, Ill., and is well known throughout the food industry.

- s b d -

NEW MEMPHIS SERVICE

Ticker service, the first originating in Memphis, Tenn., will begin shortly, fostered by the Memphis Merchants Exchange. This service will ultimately carry the prices, sales and quotations of the cottonseed and soybean oil meal futures markets of the Memphis Merchants Exchange to other trading centers in all parts of the country. The service has been authorized by Western Union.

The new service will carry the news of the Memphis market, New York cottonseed and soybean oil markets, the Chicago lard market and the Kansas City mill feeds markets. It is aimed particularly at servicing the dealers, manufacturers, processors and handlers of cottonseed and soybeans and their products.

It is expected that the service will be extended to Kansas City, Chicago, Dallas and other centers interested in soybean and cotton seed products.

- s b d -

COSTS HAVE RISEN

Cash costs of raising soybeans have risen 50 percent since 1924, reports R. H. Wilcox, farm management specialist of the University of Illinois.

This compares with the cash costs of raising corn, which have doubled since 1915; and of oats and wheat which have more than doubled, according to Wilcox.

Save up to \$1.00 A TON IN SACKING COSTS!

Mills throughout the middlewest have found they can cut their sacking costs up to \$1.00 a ton and STILL HAVE high quality, new looking bags with their regular imprint! Those mills are using 'NU-SEME' burlap cotton bags, made exclusively by WESTERN Burlap Bag Co.

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A small illustration of a person riding a horse and holding a whip is positioned next to the company name.

FINAL DRIVE FOR MARGARINE REPEAL

Repeal of federal taxes and license fees on margarine moved a step closer April 27 when the finance committee of the U. S. Senate reported out the margarine bill substantially as already passed by the House. The bill would repeal all taxes and license fees on white and yellow margarine.

The committee approved three amendments covering requirements on serving margarine in public eating places, assuring that there will be no contravention of state laws and setting July 1 as the effective date of the bill.

It seems certain that amendments backed by the butter interests will be offered on the Senate floor. These include the Wiley amendment to prohibit interstate commerce in yellow margarine and the Johnson amendment to include repeal of certain federal excise taxes. Both were rejected by the Senate finance committee.

In Ohio the question of repealing the ban on manufacture and sale of yellow margarine seems certain to go to a vote of the people. On April 28 the Ohio House tabled Senate Bill No. 6. This makes any legislative action in this session unlikely.

If no action is taken, a special referendum is mandatory, since the question was brought to the legislature by petition. The petitions were so worded as to make repeal effective only on margarine made from U. S.-produced fats, if the referendum carries—as seems certain.

American Soybean Association



C. M. GREGORY: "A 30-million-dollar tax on growers."

representatives testified in favor of margarine repeal bills in Illinois and Washington, D. C., during April.

ASA Director Frank Garwood, Stonington, Ill., and C. G. Simcox, Assumption (Ill.) Co-op Grain Co., appeared for ASA before the Illinois Senate agricultural committee in Springfield April 20. Ralph Wells, Monmouth, Ill., testified as a processor.

Albert Dimond, Lovington, Ill., testified for the Association at House agriculture committee hearings May 3.

The Illinois Senate bill would completely repeal all restrictions on margarine; but the House measure, HR 243, would repeal restrictions only on margarine made from domestic fats. Chances seem to be good that the Senate bill will also finally take this form.

Appearing before the U. S. Senate finance committee in Washington, D. C., on behalf of the Association April 12 were:

Geo. M. Strayer, Association secretary-treasurer, Hudson, Iowa; David G. Wing, Mechanicsburg, Ohio; J. W. Calland, managing director of the National Soybean Crop Improvement Council, Decatur, Ind.; and C. M. Gregory, Farmers Cooperative Co., Dike, Iowa.

They urged adoption of the Poage bill as passed by the House April 1.

"It is the belief of the American Soybean Association that yellow margarine made from domestically produced fats and oils should be allowed to sell for what it is, on the basis of its true value, without federal or state taxes or discrimination," said Strayer.

"We believe that butter has a right to a free market, and that soybean oil in the form of margarine has a similar right. We believe that the immediate removal of federal taxes and color restrictions on margarine will benefit not only the producer of soybeans, cottonseed, peanuts and corn, but also the producer of dairy products, including butterfat."

Wing said he raises both soybeans and Jersey cows and hogs on his Ohio farm but "I can figure no way to build my fences high enough to tax my soybeans against my dairy cows or my hogs."

"Ever since the day of vegetable shortening lard has been in surplus and most of the time has sold below the price of hogs... Yet the hog

raisers have never asked that vegetable shortening be colored green or that a tax be placed on it to protect lard."

"I do not worry in the least that the soybean oil which we raise just over the fence from the cows and the hogs will ever put either one out of business, and I hope to live to prove to some of my friends in Ohio and Washington that we will not kill 2 million dairy cows if margarine is colored and made tax free."

Gregory pointed out that the federal margarine tax would constitute a huge levy on soybean-growing farm acres if all margarine were colored yellow to meet consumer preference.

"The federal tax thus imposed would amount to 25 or 30 million dollars a year," he said. "This would be the equivalent of \$2.50 to \$3 an acre for each acre of soybeans grown in the U. S., or \$12.50 to \$15 per acre for that portion of the crop which goes into margarine... The soybean industry is too important to tolerate such an artificial barrier."

Calland appeared to refute charges that soybeans are ruining American soils. "Most of the millions of acres of eroded land in America got that way before we started to grow soybeans," he said.

Some actions were taken by the states in April to advance the position of margarine.

In New York a bill permitting the use of margarine by state institutions was approved by the governor.

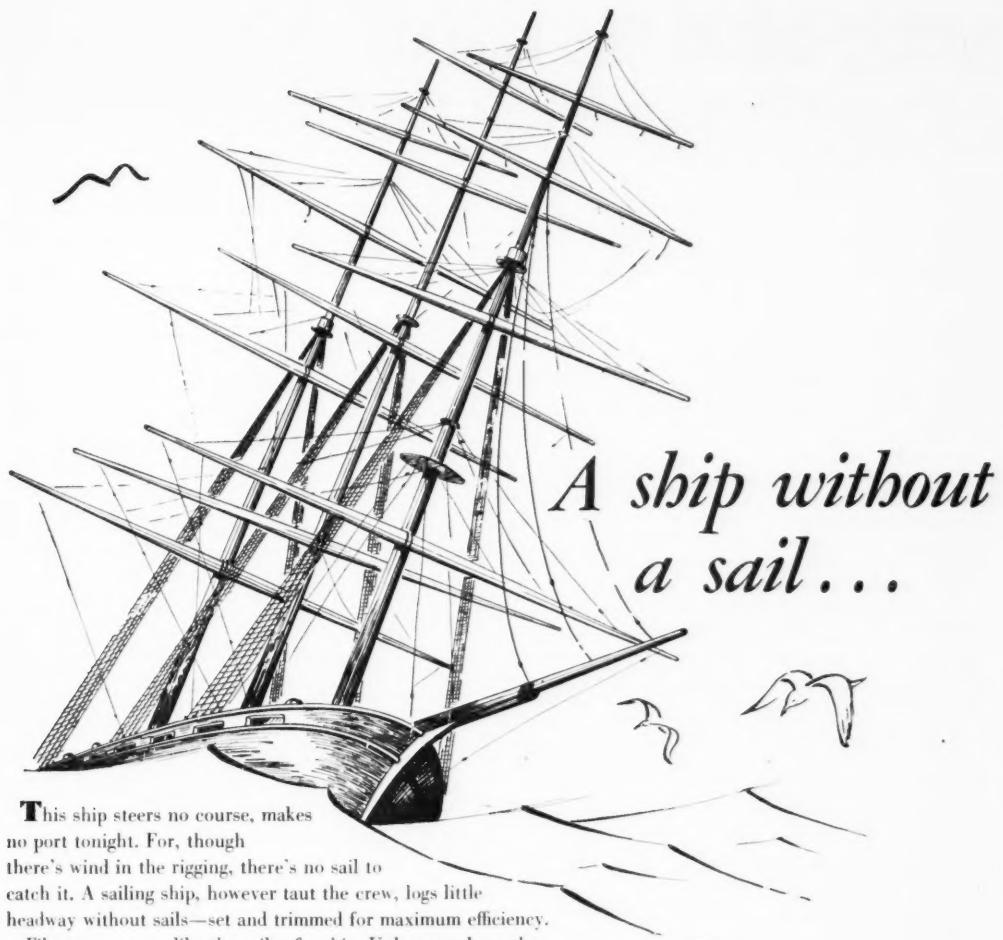
In North Carolina the House passed \$140 without roll call. This repeals the prohibition on yellow margarine in eating places and reduces wholesalers license fees from \$75 to \$25. Only remaining restriction is notification of patrons in public eating places when margarine is served.

The governor of Pennsylvania approved a bill repealing the prohibition against the use of margarine in public eating places.

State Actions

In Connecticut both the Senate and House passed repeal bills that differed in that the House bill kept the prohibition against yellow color. Bans on institutional use and all license fees were thrown out by both bills.

In California a bill to repeal the ban on yellow margarine was referred to the livestock and dairies committee. The Los Angeles Mirror ironically compared this action to referring the Atlantic pact to Joe Stalin.



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This ship steers no course, makes no port tonight. For, though there's wind in the rigging, there's no sail to catch it. A sailing ship, however taut the crew, logs little headway without sails—set and trimmed for maximum efficiency.

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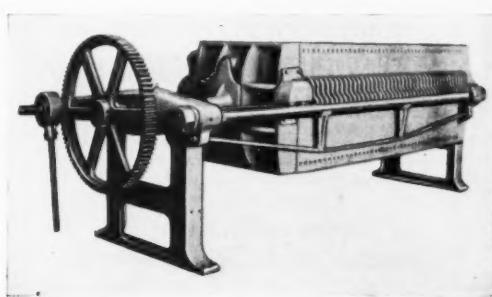
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MARKED CUT IN SOY ACREAGE

Cut in soybean acreage under 1948 will be deeper than the 3.9% decrease forecast by the U. S. Department of Agriculture March 1. Soybean Digest crop reporters indicated late in April.

Strongest factor in the probable decrease is the low price of soybeans as compared with corn and cotton. In the big corn areas there is a shift from soybeans to corn. And in cotton sections the favorable support price for 1949 crop cotton compared with the unsettled bean market is hurting soybean acreage.

Observers say that historical bases for wheat support set by AAA are favorable to a maximum corn acreage. Some wheat and oats are replacing soybeans.

Generally favorable planting weather to date indicates that there may not be so much emergency planting of soybeans as replacement for other crops as in some years, though this depends on the weather from now on.

However, some acreage will be diverted to soybeans due to winter-killing of clover and alfalfa.

Soybean acreage will decrease in parts of Arkansas, in Illinois, Indiana, Iowa, Kentucky, Louisiana, Missouri (slightly), Ohio and Tennessee. Increases are forecast for eastern Nebraska, Kansas and Ontario.

Test germination of soybeans has been low in many parts of the soy belt, largely due to injury at combining time.

Reports of Soybean Digest correspondents follow:

ARKANSAS

L. M. Humphrey, R. L. Dorch Seed Farms, Little Rock for Little Rock area (Apr. 22): Probable acreage 75% or less of 1948 and less

than USDA forecast. Much lower prices of beans and continued high price of cotton causing serious reduction in bean acreage, unless weather very unfavorable for cotton. So far very few beans planted. Some increase in S-100, Dorchsoy 2 and 31. Decrease in Arksoy, Ralsoy and Dorchsoy 7.

FLORIDA

E. N. Stephens, county agent, Pensacola, for Escambia County (Apr. 22): Probable acreage same as 1948 and USDA forecast. Acreage would probably be increased 40-50% if CCC storage facilities were available to insure farmers of government support price. Oil mills take advantage of this handicap.

ILLINOIS

Walter W. McLaughlin, Citizens National Bank of Decatur Ill. (Apr. 22): Probable acreage 90% of 1948. Marketing conditions causing decrease. Clover condition bad but most replanted acreage being planted to corn. Seed germinating well. Weather conditions excellent.

J. E. Johnson, Champaign for Champaign and adjoining counties (Apr. 22): Probable acreage 90% of 1948 and some lower than USDA forecast. Slowly declining yields for past 4 years one factor. recent market actions another. Growers have the opinion prices have been brought to a lower level than value of soybeans would justify. Farmers have been gradually selling stored beans. Seeding time will not show a heavy amount on farms or in storage. Farmers feel they have made a mistake. Facts are they have demonstrated they can store the crop. Price has nothing to do with storage of 1948 crop. Corn will replace soybeans and poor clover stands due to

higher return. Some recent reports indicate possibility of lower germination than last year. Soybeans were very dry at harvest, resulting in considerable mechanical damage. Cracked seed coats more serious than generally conceded. Work season very favorable. Outlook tends to indicate low moisture season. An effort has been made to push Hawkeye variety. Thinking growers are staying with full season varieties. Following very aggravating situation of pricing Hawkeye beans out of market. seed prices now getting down to basis related to market price of commercial beans.

E. E. Eversole, Hindsboro, for Douglas county (Apr. 20): Probable acreage 30% of 1948. Unless a better than reported \$2.12 support price will be 15% reduction in acreage. Should Brannan proposal be passed acreage might be further reduced. About 10% increase in wheat acreage over 1948. Reports of 90% seed germination. Weather conditions perfect. Lots of moisture at this date. Almost every field ready to plant May 10. 5% Hawkeyes, 90% Lincolns here.

Robert W. Weitzer, Valley Farms, Wrights, Ill., for west central (Apr. 23): Probable acreage 90% of 1948. Decrease due to low prices and coming controls on corn. Poor season for oats so maybe some of that ground will go into beans. Plenty of moisture. Mainly Lincoln grown here, with Rickard Korean, Wabash and Hawkeye.

Gilbert F. Smith, Mahomet for east central (Apr. 25): Probable acreage same as 1948. This section plants very much same acreage every year. We have our share of rain but not too much for subsoil moisture.

INDIANA

J. B. Edmondson, Danville, for

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SOYBEAN DIGEST

south central (Apr. 22): Probable acreage 8-10% under 1948. Ap-parent drift back to higher acreages of small grain and grasses will affect both corn and soys. Large acreage of clover and alfalfa went out due to winter damage. Soybeans will get sizable share of this acreage, probably more than corn. Best seed germination for number of years. Ideal spring so far for plowing and getting oats crop in. Gumbo breaking up unusually tough; much of stalk ground trampled when wet and is cloddy. Lincolns will still predominate though Hawkeyes will gain considerably on river bottoms and richer soils.

Peter J. Lux, state PMA, Indianapolis (Apr. 25): Probable acreage about same as 1948 and less than USDA forecast. Seed germinating good. Weather normal. Increased amount of Hawkeye seeded.

IOWA

O. N. La Follette, State Department of Agriculture, Des Moines: Probable 1949 acreage should be equal to 1948 or nearly so and above USDA forecast. Shortage of legume hay may turn more bean acreage to hay crop instead of seed harvest. Germination varies from good to very poor. Weather conditions okay.

Otis J. Luttschwager, Iowa PMA Committee, Des Moines (Apr. 21): Probable acreage about 10% less than 1948, same as USDA forecast. Desire to increase grasses and legumes has increased oat acreage. Seed germinating generally good. More Hawkeyes and Lincolns will be planted.

Fred Hawthorn, Castana, for western (Apr. 22): Probable acreage 75% of 1948. Low prices discouraging farmers from planting beans. Winter killing of wheat may mean more bean acreage. Seed germinating rather poor. Weather conditions wet and cool. Some growers of Lincolns switching to Hawkeyes.

KANSAS

E. A. Cleavinger, extension service, Kansas State College, Manhattan for eastern (Apr. 22): My estimate 110% of 1948 acreage, 5% less than USDA forecast. Market conditions will not affect soybean acreage much in Kansas. Late spring has decreased intended oat acreage. Some of this acreage will be diverted to soybeans. Germination of certified seed samples excellent. General run samples only fair.

KENTUCKY

Bureau of Agricultural Economics USDA, Louisville: 9% decrease indicated for soybeans, but favorable spring seeding weather may lead farmers to plant somewhat more acreage.

LOUISIANA

W. M. Scott, Tallulah (Apr. 24): Probable acreage 80-85% of 1948, about same as USDA forecast. Market has discouraged planting of beans in favor of cotton due to support price for cotton in 1949. Beans and corn may be planted after May 15 if weather is too bad to get cotton planted by then, otherwise bean acreage will be reduced.

MINNESOTA

R. E. Hodgson, Waseca for southeast (Apr. 20): Probable acreage 100% of 1948 (pure guess). Flax may take some bean acreage. Weather next 30 days will have lot to do with bean acreage seeded. Winter wheat looks good but acreage small. If corn planting delayed more beans may be substituted. Most seed germinating low. A few plots of Lincoln have matured in favorable falls. Others may try them. Even Richland too late to be safe except on special areas where soil early.

MISSOURI

A. F. Stephens, general agricultural agent, Gulf Mobile & Ohio Railway, St. Louis, for northeast

Missouri and central Illinois (Apr. 26): Probable acreage northeast Missouri 100%, central Illinois 90% of 1948. Late spring decreased oat acreage in northeast Missouri. Seed germinating good. Weather cool and late. Increase in Hawkeyes in Illinois.

John E. Brown, Cypress Land Farms Co., Jaywye, for southeast (Apr. 25): Probable acreage down 10% compared with 1948, and lower than USDA forecast. Unsettled market compared with ample price support on cotton makes latter more profitable. Seed germination excellent, most 90% or above. Ground very cloddy with subsoil moisture sufficient but surface very dry. More Ogden and S-100 with fewer Ralson and Arksoy to be planted.

J. Ross Fleetwood, extension specialist field crops, Columbia (Apr. 22): Probable acreage over 95% of last year, 5% less than USDA forecast. Effect of market conditions will not be too great since acreage confined to specially adapted areas. Late, wet spring has reduced oat acreage. Continued unfavorable planting weather would reduce corn and soy acreage would increase. Germination tests are okay on average. Season 3 weeks late. Big increase in S-100 in southeast.

G. H. Banks, director of agricultural research, O. H. Acom Farms, Wardell, for Pemiscot County (Apr. 23): Probable acreage 95% of 1948. Effect of market conditions on acreage slight; all beans were sold last fall as harvested. Any slowing up of cotton planting will be reflected in increased June planting of soybeans. Weather dry. Entirely too much rain in December, January, February and March. Much land cloddy.

NEBRASKA

Donald G. Hanway, assistant in agronomy, Nebraska Agricultural

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Experiment Station, Lincoln, for eastern (Apr. 27): Probable acreage 100-105% of 1948 above USDA forecast. Considerable winterkilling of wheat will result in increased seeding of soybeans in areas where have been grown extensively.

OHIO

L. A. Gilliland, Gilliland Grain & Coal Co., Van Wert for northwest (Apr. 20): Probable acreage 90% of 1948. Beans priced too low in comparison with other crops. In case weather is too wet for corn planting bean acreage will increase. Normal oats acreage has been planted. Ground is plowing fine and working up very satisfactorily.

G. G. McIlroy, Irwin, for Central (Apr. 20): Probable acreage 10% less than 1948. Weakness of market past 2 months is discouraging factor for grower. If we have a wet planting time and corn planting is held up some fields originally planned for corn will be planted to soybeans. Seed germinating good in this particular section. Some certified Hawk-eyes showing 95% or better. Weather favorable for spring work to date. Major portion of oat acreage planted earlier than usual. Increase in Hawk-eyes due to last year's favorable results.

D. F. Beard, extension agronomist, Ohio State University, Columbus (Apr. 25): Probable acreage 90% of 1948, less than USDA forecast. \$2 soybeans never have competed in net income with \$1.40 corn. Draw your own conclusions! Weather favorable thus far for bumper corn acreage. Seed is germinating okay. Fewer Earlyana and Richland, more Hawkeye, Lincoln and Monroe. Historical bases now being established for wheat by AAA are big incentive for maximum corn acreage this year.

David G. Wing, Mechanicsburg, for west central (Apr. 25): Probable acreage 85-90% of 1948. Small farms are going out of soybeans in favor of corn, oats and wheat. Price of corn more favorable than price of beans. If weather is unfavorable to corn planting more beans may be planted. Plowing well along now. Germination seems okay. Weather favorable for oats and early plowing.

TENNESSEE

Peter Fredrickson, manager West Tennessee Soya Mill Inc., Tiptonville, for west (Apr. 22): Probable acreage 85% of 1948. Market conditions cause of reduction. Decrease in bean acreage will go to cotton. Seed germinating good.

ONTARIO

R. H. Peck, River Canard, Ontario, Canada for southeast (Apr. 22): Probable acreage 125% of 1948. Present outlook shows soybeans in good position compared to other crops. Some cash contract crops as tomatoes and sweet corn have had drastic price and acreage cuts, some of which will go into beans. Continued wet weather will delay some spring grain seeding, and canning peas which acreage may be planted to soybeans. Seed germinating fairly good.

— ■ ■ ■ —

BUILD NEW ELEVATORS

Delta Grain Elevator Co., Tallulah, La., is building two elevators this summer, one at St. Joseph and one at Lake Providence, La., the owners announce.

The elevators will have one car storage but will have a capacity of 2,000 bushels per hour.

The firm now has a 7,000-bushel elevator at Tallulah. Lon Caneer is manager and owner with Virgil Harris, Tallulah, and Herbert Wilson, Senath, Mo. All the firm's elevators are on the Missouri & Pacific railroad.



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Publications

REPORT ON HAIL DAMAGE TO SOYBEANS

Although hail has caused considerable damage to soybeans in parts of the Midwest, little was known about the evaluation of hail losses to soybeans until the experiments simulating hail damage to soybeans were undertaken by Kalton, Weber and Eldredge at Ames.

Neither farmers nor hail adjustors knew the recovery to expect after soybean crops were damaged by hail at different stages of plant development. The experiments at Iowa State College were undertaken during the 1943-46 seasons to provide this information.

Hailstorms cause various kinds and degrees of injury to soybean plants. In some instances only a few leaves are torn off or shredded and stems slightly bruised. In other cases practically all leaves may be removed and many plants may be broken down or cut off. In the latter part of the season pods may be bruised or knocked off in addition to leaf and stem injuries. Terminal buds may be cut off or damaged at different stages of development.

Hailstorms cannot be manufactured at will, but the authors were able to inflict damage to soybean plants similar to the various types of injury caused by hail.

Reports on the results of their work have been carried in the Soy-

bean Digest. (See June 1946, page 10; and July 1947, page 14.)

Research Bulletin 359 carries a complete summary on the hail damage work.

EFFECT OF INJURY SIMULATING HAIL DAMAGE TO SOYBEANS. By R. R. Kalton, C. R. Weber and J. C. Eldredge, Iowa Agricultural Experiment Station, Ames, Iowa.

FEEDING

Fish Solubles

The addition of 3 percent of fish solubles to a chick ration containing yellow corn, soybean oil meal, and vitamin and mineral supplements consistently produced a growth response greater than that obtained with a standard chick starter which was considered to be adequate. The addition of adequate levels of all known members of the B complex vitamins except biotin increased the rate of gain.

This gain however, did not equal that obtained when the ration was supplemented with both B complex vitamins and fish solubles. A similar growth response was observed when 1 to 20 liver powder replaced the fish solubles. DL methionine did not bring about a significant increase in the rate of gain.

Chicks hatched from breeder flocks fed a corn-soybean oil meal breeder ration suffered a mortality of 68 percent during the first weeks of the growing period when fed the unsupplemented corn-soybean oil meal chick starter ration. The addition of 1 percent of fish solubles to this chick starter ration reduced mortality in subsequent tests to 25 percent.

The unidentified factor responsible for this increase in rate of growth and higher viability is present in the water soluble fraction of fish solubles.

GROWTH FACTOR STUDIES WITH ALL VEGETABLE PROTEIN CHICK RATIONS. By Eskel O. Essary, Rebecca Emerson, Robert MacVicar and Rollin H. Thayer, Oklahoma Agricultural Experiment Station, Stillwater, Okla. Paper presented at the 37th annual meeting of the Poultry Science Association.

Soy, Cottonseed Meal

The supplemental values of 4 percent meat and bone scraps, 4 percent fish meal and 7 percent meat and bone scraps were compared when each of these amounts were fed in three separate chick starter rations containing soybean oil meal and compared with three rations that contained cottonseed meal.

When the supplemental value of 4 percent meat and bone scraps, 4 percent fish meal, and 7 percent meat and bone scraps, were compared in rations containing soybean oil meal, there were no significant differences in any of the soybean oil meal replicates. When the soybean oil meal and cottonseed meal rations containing the same animal protein sup-

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plements were compared it was found that meat and bone scraps, when added to the soybean oil meal diets, gave significantly better growth than when added to the rations containing cottonseed meal.

There was no significant difference when the rations containing 20 percent soybean oil meal and 4 percent fish meal was compared with one containing 20 percent cottonseed meal and a like amount of fish meal.

A COMPARISON OF SOYBEAN OIL MEAL AND COTTONSEED MEAL WITH VARIOUS PROTEIN SUPPLEMENTS IN CHICK STARTER RATIONS. By Harry L. German and R. M. Sherwood. Department of poultry husbandry, A&M College of Texas, College Station, Texas. Paper presented at the 37th annual meeting of the Poultry Science Association.

Alcohol Extraction

Soy flakes have about the same nutritional value whether they are extracted with hexane or with alcohol, say workers at the Western Regional Research Laboratory.

They have studied the growth-promoting value of soybeans subjected to various forms of heat treatment or to alcohol or to hexane extraction, with rats as the subjects.

Treatment of raw soybeans with steam at 15 pounds pressure gave a product of maximum nutritional value after 10 to 15 minutes. Further heating caused a decrease due to a deficiency of methionine, lysine and leucine.

Steam at about atmospheric pressure for 30 minutes resulted in a slightly higher maximum, and less destruction took place on prolonged heating. Dry heat had no effect.

Nutritional values of hexane- and alcohol-extracted soy flakes were essentially the same and equal to that of the steamed, unextracted soybeans. Inclusion in the diets of the oils extracted by the two solvents had no influence on the results.

FOOD VALUE OF SOYBEAN PROTEIN AS RELATED TO PROCESSING. By A. A. Klose, Barbara Hill and H. L. Fevold, Western Regional Research Laboratory, Albany, Calif. *Food Technology*, July 1948.

Animal Protein

An addition of either fish solubles or a mixture of dried milk and liver meal gave a significant increase in growth rate of chicks fed a soybean oil meal and mixed grain ration.

Two experiments were conducted at Purdue Experiment Station with

young chicks fed a ration containing ground oats, ground barley, wheat bran and wheat middlings in addition to corn, soybean oil meal, minerals and sources of vitamin A and D.

Rapid growth was not obtained when the ration was supplemented with all known vitamins and methionine. An increase in the protein level by the addition of more soybean oil meal did not increase the growth rate. But the addition of the fish solubles or the dried milk-liver meal mixture did give a significant increase.

VITAMIN SUPPLEMENTS IN A SOYBEAN MEAL AND MIXED

GRAIN RATION. By R. W. Gerry, C. W. Carrick and S. M. Hauge, Purdue University, Lafayette, Ind. Paper presented before the 37th annual meeting of the Poultry Science Association.

APF Deficiency

The growth of chickens fed diets high in soybean oil meal and deficient in the unknown dietary factor found in fish meal and in cow manure was improved by the addition to the diet of 0.005 percent of 3-nitro, 4-hydroxyphenyl arsonic acid, according to workers at the Bureau of Animal Industry.

The compound did not function

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as a substitute either for the unknown factor or for methionine. With diets containing raw soybeans the arsonic acid derivative, the unknown factor and methionine were mutually supplementary. The arsonic acid derivative was effective when fed with soybean oil meal, but less effective than the unknown factor.

EFFECT OF ARSONIC ACID DERIVATIVES IN STIMULATING GROWTH OF CHICKENS. By H. R. Bird, A. C. Groschke and Max Rubin, Bureau of Animal Industry, Beltsville, Md. *Journal of Nutrition*, Feb. 10, 1949.

Lack of Iodine

Iodine deficiency in the U. S. occurs in the well-known goiter belt in the northern part of the country. On inadequate intakes of iodine, goiter may be accentuated in farm animals by the so-called goitrogenic factor present in soybean oil meal and rapeseed meal. Excess calcium may also accentuate the deficiency.

Deficiency symptoms can be prevented by utilizing iodized salt in the place of ordinary salt, especially during the last half of pregnancy in cows, mares, ewes, and sows in the states included in the goiter belt.

TRACE MINERALS IN THE NUTRITION OF FARM ANIMALS. H. S. Wiggins, Colorado Agricultural Experiment Station, Fort Collins, Colo. *American Miller and Processor*, Jan. 1949. Chicago, Ill.

Growth Inhibitor

Four experiments at Purdue University have confirmed the presence of a chick-growth inhibitor in raw soybean oil meal.

The growth retarding effect was

found to be greater on females than on males.

The addition of DL methionine apparently reduced the effect of the inhibitor but it was obvious that it is not the only factor involved.

UNTOASTED SOYBEAN OIL MEAL IN A SIMPLIFIED CHICK RATION. By R. W. Gerry, C. W. Carrick and S. M. Hauge, Purdue University. *Poultry Science*, Sept. 1948.

MISCELLANEOUS

Vegetable Varieties

Yields of the better varieties and selections of vegetable soybeans compared well with yields of commercial oil varieties in tests at the Delta Branch Station, Stoneville, Miss., Robert B. Carr reports.

The tests were conducted as part of the cooperative research program between the U. S. Department of Agriculture and the Mississippi Experiment Station. Seed was planted May 28. In general, the quality of the green shelled beans would have rated good to very good.

The higher yielding varieties in the test included: Early varieties, maturing as a green vegetable in August: D58-5 and D48-3 (Delta Station selections) and Imperial. Medium, maturing in September: Roku sun 9 and 6, and Easy Cook.

Late, maturing in October: Roku sun 12, Wood's Yellow and Nanda 13.

COMPARE VEGETABLE SOYBEAN VARIETIES AT DELTA STATION. By Robert B. Carr, assistant agronomist, Division of Farm

Crops and Diseases. *Mississippi Farm Research*, State College, Miss., Dec. 1948.

Farm Crop Storage

TENTATIVE FUNCTIONAL REQUIREMENTS FOR CONDITIONING AND STORING FARM CROPS. Folder by Armeo Steel Corp., Middletown, Ohio.

A table on bulk storage requirements, pressures of stored grain, average outside air conditions in the Cornbelt for the month following harvest, and optimum requirements for bulk drying.

Crops covered are ear corn, shell-ed corn, wheat, barley, oats, sorghum, soybeans, baled hay, chopped hay, and long hay. Published and made available free by the market development division, Armco Steel Corp.

The table is based on data obtained from studies under the Armco-Purdue University fellowship. It supplements an earlier bulletin by the same company, entitled *Storing High Moisture Content Corn and Grain*.

ADHESIVE POWER OF PROTEIN PREPARED FROM OIL-FREE FLAKES OF SOYBEAN REDUCED BY USING VARIOUS REAGENTS IN EXTRACTING OIL. *Chemical Extracts*, Feb. 25, 1949. American Chemical Society, Washington, D. C.

The adhesive powers of soybean protein obtained by using various oil extraction reagents are compared.

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FROM THE WORLD OF SOY

"House that Joyce Built", an account of the growth of the Glidden Co., Cleveland, Ohio, appears in May issue of Fortune. The company is described as a splendidly successful example of "functional diversification," with products ranging from paints to mayonnaise, and cattle feed to fire foam.

* * * *

Appointment of Hugh J. McCullough as credit manager of the Glidden Co.'s feed mill division, is announced. He had served as assistant credit manager of Glidden's Durkee Famous Foods division in Berkeley, Calif., for 2 years.

* * * *

Stanly P. Stephenson, Jr., has been placed in charge of sales for the American Mineral Spirits Co. in the southwestern territory with headquarters at 22 Marietta Street Bldg., Atlanta, Ga. He replaces John A. Kennedy who has been moved to the company's eastern headquarters in New York City. Stephenson has traveled extensively in southern territory.

* * * *

A packed program of new developments in the grain elevator line will be presented at the 20th annual convention of the Society of Grain Elevator Superintendents to be held at Hotel Nicollet, Minneapolis, Minn., May 11-14, announces Clifford MacIver of Archer-Daniels-Midland Co., president.

* * * *

Erbach & Son Co., 200 E. Liberty St., Ann Arbor, Mich., has introduced a new style and size in its house organ, the Announcer. The firm is now in its 106th year.

* * * *

Directors of St. Regis Paper Co. announce the election of Arch Carswell as vice president. Carswell became general sales manager of the firm's Multiwall bag division early in 1948. He will continue in charge of sales for the division.

* * * *

Dr. W. E. Hanford, director of petroleum and chemical research of the M. W. Kellogg Co., has been elected a vice president of the company. He joined the firm in 1948.

* * * *

Elton Kile, of Fre' Kile & Son, Kileville, Ohio, is reported to be making a good recovery from a recent illness.

* * * *

Richard Alcott, vice president and general sales manager of the Riechman-Crosby Co., Memphis, Tenn., recently observed the 40th anniversary of his connection with the firm. He began his career under the present active members, J. A. Riechman and H. H. Crosby.

* * * *

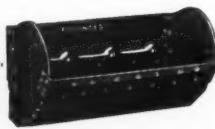
Dr. Alexander Schwarczman, research director, Spencer Kellogg & Sons, Inc., Buffalo, N. Y., was a recent speaker at a luncheon meeting of the Gold-

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TAKES BANK POST

Walter W. McLaughlin, president of McLaughlin Agriculture Service, Inc., has been appointed manager of the farm service department of Citizens National Bank, Decatur, Ill. He succeeds Roy E. Yung, appointed state director of agriculture.

In taking the post McLaughlin returns to head the farm management and agricultural credit department that he organized for the bank in 1928. Management of the 10,000 acres of farm land in his charge as head of the McLaughlin Agricultural Service will be transferred to the bank.

McLaughlin is former president of the American Soybean Association. He is also a former president of the Illinois Farm Managers and Rural Appraisers Association and the American Society of Farm Managers and Rural Appraisers.

A-D-M OFFICIAL DIES

Walter L. Dedon, 59, executive vice president and treasurer of Archer-Daniels-Midland Co., died April 3 at his office in the Roanoke building, in Minneapolis.

Born at Lindstrom, Minn., Jan. 18, 1890, Mr. Dedon joined Midland Linseed Products Co. in 1911 and became affiliated with Archer-Daniels-Midland Co. when the present company was formed in 1923.

A year later he was elected assist-

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Laboratories:

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WOODSON - TENENT LABORATORIES MEMPHIS, TENN.

Analytical Chemists

SPECIALIZING IN ANALYSES OF SOYBEANS--OILS--MEALS

800
"OVER 500 MILLION DOLLARS WORTH OF PRODUCTS ANALYZED SINCE 1935!"

Yes sir, it's YOUR INOCULANT

You'll find plenty of men who praise LEGUME-AID Soybean Inoculant from personal experience. Most of them will especially mention its finely ground, non-sticky humus mass that coats seeds quickly with potent nitrogen fixing bacteria and actually lubricates their passage through the planting machine.

LEGUME-AID



The strains of bacteria in this famous inoculant are field selected, laboratory checked and crop tested. The scientifically devised inner-lined carton package protects their potency. This LEGUME-AID unit for soybeans contains exactly enough to inoculate five bushels of seed. Order what you need. Open each package fresh as you treat each batch of seed. No waste, no loss, no troublesome measuring. Tell your dealer you want LEGUME-AID.

AGRICULTURAL LABORATORIES, INC.

1322 Chesapeake Avenue

COLUMBUS 2, OHIO

The INOCULANT in the CARTON



en Gate Paint, Varnish and Lacquer Association, San Francisco, Calif. His subject: "The Epic Development of Soybean Oil in American Agricultural History."

The Farmers Union Jobbing Association soybean processing plant at Girard, Kans., has been taken over by a new cooperative, Production Cooperative Association. The transaction involves elevators at Girard, Farlington and Beulah, Kans.

J. F. Kressler, former sales representative of Chase Bag Co.'s Cincinnati office, has been transferred to Detroit where he will direct operations of that office. He joined the company's sales force shortly after his graduation from the University of Toledo in 1937.

"It's Amazing—If You Know Soybeans," was title of a full page of pictures and story about the soybean crop and its usage in a recent issue of Sioux City (Iowa) Sunday Journal. Park Rispalje was author of the feature.

L. M. Richardson, Jr., has been appointed supervisor of edible technical services in the research department of Lever Brothers Co., with headquarters at Cambridge, Mass. He will be in charge of technical services involving uses of fats and oils in the baking and allied industries. He joined Lever in July 1948.

"Tung: Old Crop with New Uses" is the title of an article by Donald Jackson and J. C. Eiland in the March issue of Marketing Activities published by U. S. Department of Agriculture, Washington 25, D. C.

V. D. Anderson Co., 1935 W. 96th St., Cleveland 2, Ohio, has issued a folder and flow sheet on the Anderson "Exsolex" process which covers the firm's Pre-Expeller and solvent extraction combination installation. Outstanding feature of the process is the versatility of operation.

Cargill, Inc., is letting contracts for a solvent extraction plant in Chicago, reports Business Week. Capacity is 700 tons daily. The plant will be located on the Calumet River, next to the company's grain elevators.

The board of directors of General Mills, Inc., broke precedent by holding their regular monthly meeting at the firm's Chemoil plant at Kankakee, Ill., April 25. The chemical operations were presented by Whitney Eastman, chemical division vice president, Arthur Berry, plant manager, and Sewall Andrews, in charge of division sales.

S. Howes Co., Inc., Silver Creek, N. Y., has acquired the O. K. Scale Co., Buffalo, N. Y., and is moving factory equipment to the Silver Creek headquarters. Both O. K. and Howes equipment will be available.

ant treasurer. He was named a director in 1932, treasurer in 1933 and vice president and treasurer in 1945. On Nov. 19, 1947, he was elected executive vice president and treasurer.

CHANGE BY POSTEL



A. S. LEE

A. S. Lee, long time friend and active associate of the late Philip H. Postel, is now general manager of the Ph. H. Postel Milling Co., Mascoutah, Ill. B. H. Postel, president, has announced.

Lee succeeds Otto Knauss who recently retired from the milling field to enter the brokerage business.

Lee has been with the company for over 28 years and has during his long career had charge of purchasing, accounting and personnel. He will continue as secretary and treasurer of the company. His entire career has been in the firm's grain, flour, soybean and feed interests.

The firm operates a two-Expeller soybean processing plant at Mascoutah.

DICKINSON BROTHERS Co.

VEGETABLE OILS AND MEALS
BROKERS

2420 Board of Trade
141 West Jackson Blvd.



HArrison 7-3793
CHICAGO 4, ILL.

You get controlled quality with Amsco solvents...

There's a pipe for every storage tank, a pipe for every solvent. That is just one of the painstaking steps Amsco takes to keep your extraction solvent pure and free of contamination.

But Amsco solvents give you more than quality. They give you better results, greater economy, and you get prompt service and delivery wherever you are. You get these and other advantages because for 25 years Amsco has been developing, producing and improving solvents to meet individual requirements.

Here are a few of the other features of Amsco extraction solvents:

- *Amsco's high, fast rate of extraction*
- *Low solvent losses—due to close distillation, high initial boiling point of 150° F. minimum, low dry point of 158° F. maximum*
- *Freedom from objectionable residue and odor*
- *Amsco's "Service that goes beyond the sale"*

We would like to tell you more about our products and services, how they fit your particular requirements. Mail the coupon today!

SERVICE IN 48 STATES
Export inquiries invited

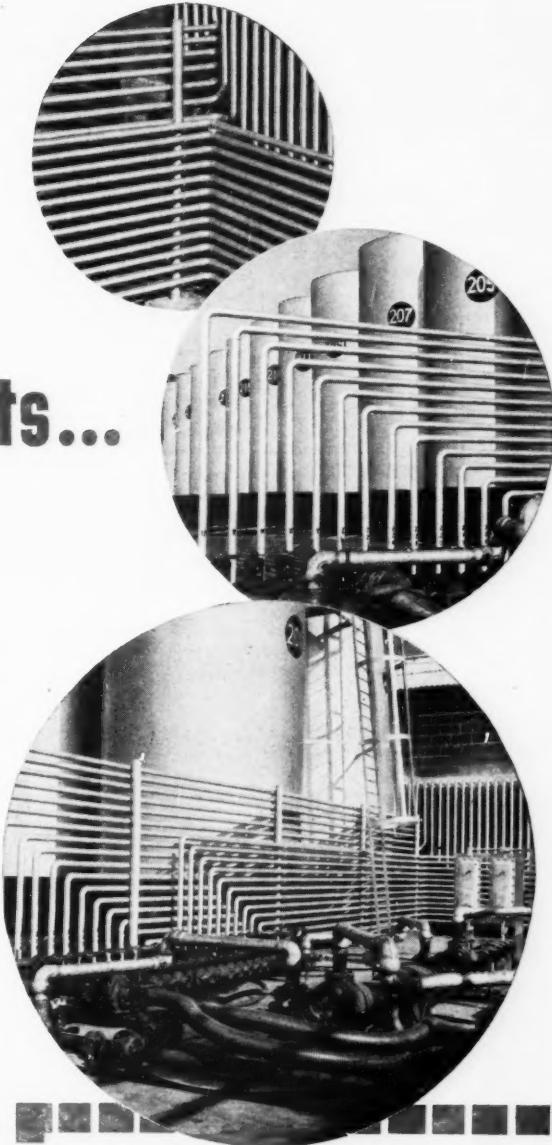


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American Mineral Spirits Company, Dept SD-11
230 North Michigan Avenue
Chicago 1, Illinois

Please send information on the complete line of Amsco petroleum-base solvents to:

Name.....

Position.....

Company.....

Street Address.....

City..... State.....

(Samples sent on request!)

Production of a completely new "Simplex" pellet mill has been announced by Sprout, Waldron & Co., Muncy, Pa. Bulletin will be sent by the company on request.

* * * *

Folders on Case beet and bean planters and "K-2" and "M-2" combines have been issued by J. I. Case Co., Inc., Racine, Wis.

* * * *

The 34th annual convention of the American Association of Cereal Chemists will be held at Hotel Statler, New York City, May 16-20. Soy products will be among the topics covered.

* * * *

About 1,000 Iowa farmers, farm boys, agriculture students and GI on-farm trainees visited the soybean processing plant and feed mixing department of Boone Valley Co-op Processing Association at Eagle Grove, Iowa, recently.

* * * *

Wilbert E. Huge, vice president of Central Soya Co., Fort Wayne, Ind., has been elected to membership in the Chicago Board of Trade.

* * * *

J. H. Day Co., Cincinnati 22, Ohio, has issued Bulletin No. 354-A covering Day sifters and mixers.

* * * *

"New Candies Are Created," by Martha G. Morrow, in Science News Letter April 2, tells about the experimental work with candies at the Southern Regional Research Laboratories in New Orleans, La. Proteins of soybeans, yeast and sunflower seed are among those being tried.

* * * *

Procter & Gamble Co., New York, has appointed Edward F. Nordell supervisor of tankcar and tankwagon sales of refined vegetable oils in metropolitan New York. He will handle cottonseed, soybean, peanut and coconut oils.

JOINS IRWIN, O. FIRM

W. G. Weigle, for 16 years manager of the Marsh Foundation farms in Van Wert County, has been associated with Farm Management, Inc., Irwin, Ohio, in the capacity of farm supervisor, serving the northeastern Ohio territory, since April 1. At the present, Weigle plans to reside in Mansfield in order that he may be close to his field of work.

Weigle is prominent nationally in agricultural circles. He is a graduate of Purdue University holding a Master's degree in agriculture, which he received in 1932. He has been active in farm management organization work.

With the addition of Weigle to its present staff of 10 experienced and trained farm supervisors, Farm Management, Inc., will extend its service in the northeastern Ohio territory. At the present time this organization is confining its management service in Ohio primarily to 35 central and western counties and in Kentucky to the Lexington area. The organization was incorporated in 1931 and has grown until today it is handling farm property belonging to 250 farm owners, valued at 15 million dollars.

The advertisement features a decorative border of soybeans. In the center, the text reads: "Ralston Purina COMPANY'S 5 Soybean Processing Plants or Cash Markets for Soybean Growers." Below this, five small illustrations of industrial buildings represent the processing plants. Labels identify them: "CIRCLEVILLE, OHIO" (top left), "IOWA FALLS, IOWA" (bottom left), "ST. LOUIS, MISSOURI" (top right), "KANSAS CITY, MISSOURI" (middle right), and "LAFAYETTE, INDIANA" (bottom right). At the bottom, a large can of "PURINA CHOWS" is shown with the slogan "Buy Purina Chows". To the left of the can, the text "BUY THE FEEDS THAT USE THE SOYBEAN" is written diagonally.

There's a lot
of talk about the
2nd largest customer
for soybean oils—
Nutritious **Margarine**

Modern U. S. pronunciation—*Mar'jar-in*

Margarine now has a regular place on the shopping lists of 84%* of American families.

And margarine has a constantly growing market. (This is *your* market, actually, if you produce or process soybean oils.)

Here are the figures—

745,867,000 pounds of margarine were produced in 1947 (an increase of 30% over 1946)

An estimated 920,000,000 pounds of margarine were produced in 1948.

And production is supported by tremendous demand! Demand is kept booming by steady, hard-selling advertising of the Margarine Association in *The Saturday Evening Post*—full pages in full color—and by steady, consistent advertising of individual brands.

Look for your good customer's advertising. Make sure your friends see it. And every opportunity you get, how about giving margarine a boost!

**Consumption 1948 and Industrial Surveys, Inc., data*

National Association of Margarine Manufacturers

Munsey Building

Washington 4, D. C.

WASHINGTON Digest

● **BRANNAN'S PLAN.** Secretary Brannan's new farm price support program has a fair chance of being enacted into law during this session of Congress.

Southern Democrats are swinging to it. Most of the Northern Democrats are expected to support the plan. Some farm-state Republicans can be counted in favor of the plan when and if it comes to a vote.

However, it is sure to be modified some. The wide power now given to the Secretary of Agriculture in the Aiken Act will be curbed.

It's expected, too, that the number of perishable commodities that would be made eligible for direct subsidy payments would be limited—probably to livestock and dairy products, poultry and potatoes.

The "unit" production feature which would restrict the amount of price support to big-scale farmers will be thrown out. The Administration has already agreed to this.

A partial self-financing scheme may be adopted to help finance subsidy payments on perishables. "Income insurance" is now being considered by several congressmen.

Under this plan producers would contribute a percent of gross sales to an insurance fund managed by the government. The government would match the funds farmers put up, and income payments would come from this source.

The insurance feature was con-

sidered by USDA officials last winter. It's now being discussed by some congressional leaders as a means of helping to finance the program and to make it more acceptable to Congress as a whole.

This scheme may or may not be adopted. But President Truman and Secretary Brannan are going after a favorable vote for the program hammer and tongs.

In other words, this is the Democratic Administration's farm program plank. If it all isn't enacted this year, Truman and Brannan will come back for the rest of it next year.

The plan has formidable opposition. Of the large general farm organizations, only the Farmers Union supports the plan. Most of the trade groups are opposed to it. The big labor organizations haven't been heard from officially, but they are counted in support of the plan.

The attitude of Southerners is the key to what Congress finally will do with the plan. If a substantial majority of Southerners support the program, which is now indicated, there is little that can stop passage of the program in at least a limited form.

Here is the Brannan plan in brief:

It sets up a minimum income goal, and translates this into support prices intended to sustain it.

The commodity price supports

By PORTER M. HEDGE

Washington Correspondent for
The Soybean Digest

would be set so as to give total U.S. farm production the same buying power it had in the last 10 years.

Latest estimate of the income goal for 1950 is \$25½ billion. Commodity price supports would be 22 percent higher than the 1939-48 average prices.

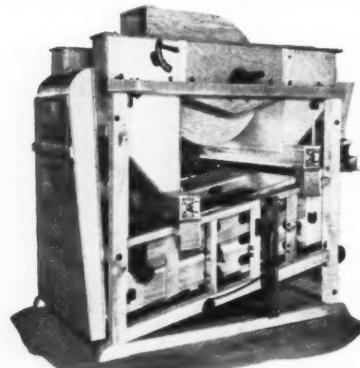
They would range from about 90 percent of present parity for the grains and cotton, to above parity for commodities in greatest demand such as meat and milk. Within a few years, price supports would approach the latest 10-year average price.

As the formula is expected to work out for 1950, the price support for soybeans would be \$2.48 a bushel, compared with the present support level of \$2.18, and an estimated \$2.07 for the 1949 crop.

Corn would be supported in 1950 at \$1.42 a bushel; hogs at \$18.54 a hundred weight.

Brannan has proposed what amounts to a new list of "basic" commodities which would be given the full support price. These are corn, cotton, wheat, tobacco, whole milk, eggs, farm chickens, hogs, beef cattle and lambs.

BARNARD & LEAS NO. 30 SERIES



"Cedar Rapids" GRAIN SEPARATORS

For

Wheat, Corn, Oats, Barley, Beans,

Rye, Rice or Soy Beans.

Newly designed to give the ultimate in cleaning and separation production.

Roller bearings and eccentrics throughout.

Write, wire or phone us for further particulars

BARNARD & LEAS MFG. CO., INC., CEDAR RAPIDS, IOWA, USA

Other commodities, including soybeans, would be supported in line with these, subject to funds and subject to the willingness of producers to keep supplies and marketings in line with demand.

Soybean producers could qualify for the same price support treatment given "basic" crops if a two-thirds majority agreed to accept production and marketing controls when called for.

The prices of storable crops would be supported the same as they are now—by loans, purchase agreements, and some times by market purchases.

Perishable commodities, such as hogs and milk, would be supported by direct payments to farmers. Market prices would be allowed to seek their own level.

Producers would receive the difference between the support price and the average price received by all farmers for a marketing period.

Suppose the hog price support were \$18.50, and the average price all farmers received was \$17. All producers would receive a \$1.50 payment, regardless of the price their own hogs brought. The idea is to make it advantageous to get as high a price in the market as possible.

Crop and marketing controls on storable commodities would be the same as those used during the last 10 years, except the cooperating farmer would have to keep within all acreage allotments and carry out minimum soil conservation practices.

To qualify for livestock or dairy income payments, producers would have to keep within all acreage allotments and carry out minimum conservation practices.

• NEW FATS BILL. Enactment of an equalization fee on imports of animal, vegetable and marine fats and oils is proposed in a bill recently introduced by Senators Gillette (D-Ia.) and Wherry (R-Neb.).

The fee, not to exceed 10 cents a pound, would be in addition to present import duties.

Up to this limit, the fee would represent the difference between the average parity price for all domestic fats and oils, and the average domestic wholesale price, as determined each month by the Secretary of Treasury.

The idea of the bill is to raise domestic fats and oils prices and at the same time encourage exports.

Importers would be issued "draw-back certificates" which could be used as an offset, or a subsidy, in the export of raw or refined fats and oils.

The bill is before Gillette's Senate agriculture subcommittee to investigate utilization of farm products. Other committee members are Lucas (D) of Illinois, Holland (D) of Florida, Aiken (R) of Vermont, and Young (R) of North Dakota.

S. 1594 introduced by Gillette and Wherry follows:

A bill to provide aid in stabilizing agriculture prices by providing an equalizing fee on imported fats and oils, an offset on exports of fats and oils, and for other purposes.

That part I of subchapter B of chapter 29 of the Internal Revenue Code (relating to import taxes) is amended by adding at the end thereof the following new section:



In a recent survey of leading soybean growers from an important soybean state, 91% said they always inoculate soybeans before planting. Among those who expressed a preference, NITRAGIN led all other brands of inoculants by almost 3 to 1. NITRAGIN has been the preferred inoculant for years . . . it boosts yields and saves soil fertility. The healthy root systems of legumes inoculated with NITRAGIN help the plants take free nitrogen from the air to enrich the land . . . to give you higher yields of richer hay and pastures. You can't afford to gamble with seed, land and time. It takes only a few minutes . . . costs only a few cents an acre to help assure success with soybeans. Protect your investment . . . always inoculate with NITRAGIN. Ask your seedsman for the "inoculant in the yellow can."



FREE Legume Booklets

A card from you will bring the free booklets that tell how to grow better soybeans and other legume crops such as clovers, alfalfa, peas and lespediza. Write today.

THE NITRAGIN CO., Inc., 3871 N. Booth St., Milwaukee 12, Wis.

"SEC. 3426, FATS AND OILS.

"(a) Whenever the average wholesale price of the principal fats and oils produced in the United States is less than the average parity price of such fats and oils there shall be levied, assessed, collected and paid, in addition to any other duties and taxes imposed by law, upon all vegetable, animal, and marine fats and oils (including materials commercially utilized for the production of such fats and oils) when imported from any foreign country into the United States or into any of its Territories and possessions, a tax per pound of oil or fat content in the amount of the difference between such average wholesale price per pound and such average parity price per pound, but such tax shall not exceed ten cents per pound. The terms 'average wholesale price' and 'average parity price' shall, for the purposes of this subsection, mean such prices as are determined under subsection (e) of this section.

"(b) Upon payment of the tax provided for in subsection (a) of this section the taxpayer shall receive a warrant of the United States in the amount of such payment, which warrant shall be negotiable and shall be redeemable at the same rate per pound of oil or fat content as was paid to the United States, under subsection (a) of this section in acquiring the warrant, upon the exportation by the holder of such warrant of an vegetable, animal, or marine fats and oils (including material commercially utilized for the production of such fats and oils), from the United States or any of its territories and possessions to any foreign country.

"(c) The Secretary of the Treasury shall—

"(1) determine and certify the average prevailing wholesale price of the principal fats and oils pro-

duced in the United States and the average parity price of such fats and oils on the thirtieth day following the approval of this Act and on the first day of each calendar month thereafter. Such certified prices shall be effective for the purposes of subsection (a) of this section on the day of certification and continue in effect until the next such certification of prices; and

"(2) prescribe rules and regulations to determine oil and fat content of materials for the purposes of this section."

SEC. 2. The amendment made by the first section of this Act shall be effective beginning on the thirtieth day after the date of enactment of this Act."

Fats and oils industry representatives also are trying to get 1 million dollars added to the appropriation for the Agricultural Research and Marketing Act for intensification of research on uses of fats and oils.

As a price bolstering move, the industry also is asking Commodity Credit Corporation to purchase 200 million pounds of tallow and grease.

• FATS, OIL PROBE. The revived Gillette Senate agricultural subcommittee is primed to take a thorough look at the animal fats and oils situation to see why prices are out of line with those of livestock and meat, reports Chicago Journal of Commerce.

The subcommittee, which pushed synthetic rubber and industrial alcohol production immediately after Pearl Harbor, has been re-established. It is headed by Senator Guy Gillette (Dem., Iowa), its former chairman, and includes Senate Majority Leader Scott Lucas (Dem., Ill.) and Senators George Aiken (Rep., Vt.), Spessard L. Holland (Dem., Fla.) and Milton R. Young (Rep., N. Dak.).

The committee was to become active immediately, with packer and renderer representatives expected to air their complaints of low animal fats prices at the first session.

Fats and oils representatives said they will point up the "mishandling" of fats and oils export allocations and controls by the government. They say this is responsible for depressed prices.

Market Street

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 5¢ per word per issue.
Minimum insertion \$1.00.

FOR SALE—Lincoln and Hawkeye soybeans. Omer J. Sears & Sons, Lapel, Ind.

FOR SALE—Certified Hawkeye soybeans. Ralph Williams, Rt. 3, Pendleton, Ind.

FOR SALE—Certified Lincoln, Richland and Hawkeye soybeans. Glen L. Kinsell Silver Lane Farms, Remington, Ind.

FOR SALE—Certified Earlyana, Richland and Hawkeye soybeans. L. W. Wyckoff, Wyckoff Hybrid Corn Co., Rt. 3, Valparaiso, Ind.

FOR SALE—Certified Earlyana, Hawkeye and Lincoln soybeans. Mitchell Farms, Windfall, Ind.

FOR SALE—Anderson Expellers all models, as is or rebuilt for specific materials. Pittcock & Associates, Moylan, Penna.

New Steel Storage Tanks

50—10,000 Gal. Cap. R. R. Car Tanks
3—42,000 Gal. & 42,000 Gal. Vert.
15—15,000, 20,000 & 25,000 Gal. Horiz.
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Glidden Testosterone, Crystalline—the principal male sex hormone.

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Glidden Testosterone and Progesterone are synthesized from Soya Stigmasterol and are used for replacement therapy of endocrine deficiencies.



The Glidden Company

SOYA PRODUCTS DIVISION

5165 West Moffat Street
Chicago 39, Illinois

THE CAMPBELL DRYING SYSTEM . . .

MORE CAPACITY AT LOWER COST — QUICKER AND EASIER INSTALLATION

Condition over 100,000 bushels of grain every 30 days with a unit which costs LESS THAN \$6,000! The Campbell Grain Dryer does this at less than full rated capacity. Or, a similar, completely self-housed unit to handle over 200,000 bushels in 30 days (removing 5% moisture) can be purchased for less than \$11,000.

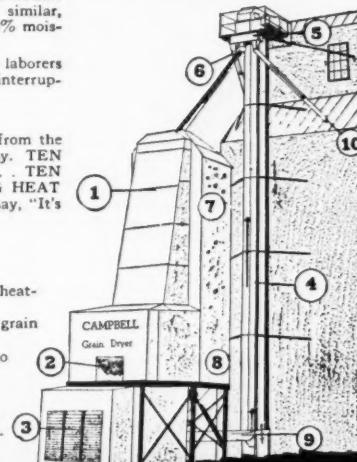
Campbell's design makes the unit easy to install. One supervisor and ordinary day laborers put up two units in ONLY NINE DAYS recently. No buildings to build — no interruption for your regular plant operations.

TOP QUALITY CONDITIONING OF GRAINS

Campbell's Exclusive Patented Drying System gently moves the water molecule from the center of the kernel to the surface where cooling air currents carry moisture away. TEN TIMES during the trip through the Campbell the grain is subjected to heat . . . TEN TIMES it is cooled to move the water to the surface. NO STEADY SEARING HEAT TO PARCH OR BURN THE TENDER GRAIN. That's why processors often say, "It's hard to tell Campbell Dried Grain from that dried in the field."

EXCLUSIVE "CAMPBELL SYSTEM" FEATURES

1. Completely self-housed unit . . . quick to install . . . takes little room.
2. Exhaust Fan which gently PULLS heated air through the wet grain.
3. Burner and Control Section — fully automatic for gas, Butane, oil or steam.
4. Low priced, specially designed, ALL STEEL DUAL ELEVATOR . . . one side wet grain, one side dry.
5. Patented overflow discharge box . . . delivers wet grain to dryer . . . excess wet grain returned to bin.
6. Overflow spout to wet bin.
7. Drying section . . . TEN series of heating and cooling.
8. Cooling section of dryer . . . cool grain goes back into house.
9. Screw Conveyor takes dried grain to dry side of Dual Elevator.
10. Discharge spout to dry bin in your house — no interruption to use of main house elevator legs.



FOR IMMEDIATE DELIVERY . . .
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Corn States HYBRID SERVICE

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GREUTKER INCORPORATED

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BUFFALO 2, NEW YORK

Specializing in
Soybean Meal for the Mixing Trade

OFFICE PHONES:

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TAG MOISTURE METER



ALL PURPOSE SCALE

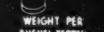


GRAIN PROBE

YOUR MAIN SOURCE OF BUYING SATISFACTION

As well as the main source for quality GRAIN AND SEED TESTING AND HANDLING EQUIPMENT AND SUPPLIES

Helpful personalized service rendered by a corps of highly trained field men, orders properly and promptly filled, and promptly shipped. Catalog listing more than 500 items. Free upon request.



BURROWS
EQUIPMENT COMPANY

1316-D SHERMAN AVE.

EVANSTON, ILL.

In The MARKETS

APRIL MARKETS STEADY

There was little change in the markets in April.

Soybeans showed some strength, May No. 2 beans moving up 10c during the month. Soybean oil was also a shade stronger, but oil meal lost a little ground.

Country holders of soybeans were said to be disposing of their stocks only gradually, though they are holding a record volume for this time of year.

Temporary life was put into the markets when the Senate finance committee voted out the margarine repeal bill and prices strengthened somewhat the last week of April.

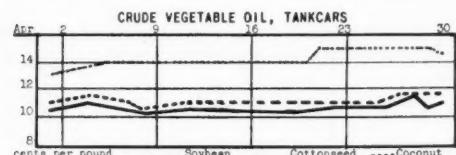
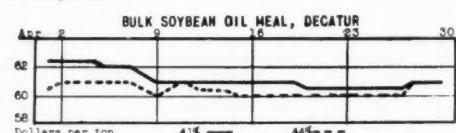
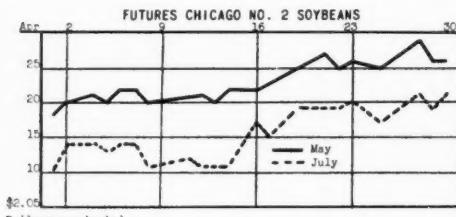
May futures for Chicago No. 2 soybeans opened at \$2.18 for the month, and closed at \$2.262, 1.8c below the high. The price trend was slightly upward most of April.

Bulk 41% soybean oil meal Decatur basis opened at \$62.50 and closed at \$61, a loss of \$1.50 for the month. Production of 44% meal was rather heavy. Forty-one percent meal was said to be scarce, though some screw press processors who had planned to close down in April continued to operate due to prices somewhat higher than a month earlier.

Crude soybean oil in tankcars opened at 10½ and closed at 11c, a gain of ½c for the month. The government, processors, small refiners and traders provided most of the demand. Big refiners were out of the market until the last week of April. They were said to be waiting for a big country movement of soybeans to develop.

There was fairly heavy activity in soybean oil the last few days of the month.

The New York Produce Exchange approved by a one-sided vote the proposal to institute trading in crude



SOYBEAN DIGEST

soybean oil futures on the Exchange. The date when trading will open will be announced later.

MEMPHIS SOYBEAN OIL MEAL FUTURE CLOSINGS

Apr. 30

May, 63.50-64.50; July, 57.50-58.25; Oct., 51.50-52.25; Dec., 50.00-50.50; Jan., 48.50-49.50; Mar., 48.25-49.00. Sales: None.

*Reported by the Chicago Journal of Commerce.

● 1949 PRICE SUPPORT. The support level for 1949-crop soybeans grading U. S. No. 2 and containing not more than 14 percent moisture will be 90 percent of the comparable price for all soybeans on September 1, 1949, it was announced by Production and Marketing Administration, U. S. Department of Agriculture. Premiums and discounts will apply to other grades.

To be eligible for loan or purchase agreements, the soybeans must grade U. S. No. 4 or better, and must not contain more than 14 percent moisture. A premium of 1 cent per bushel will be applicable to green and yellow varieties, and a discount of 19 cents per bushel for black, brown and mixed varieties.

Loans and purchase agreements will be available to producers from time of harvest through January 31, 1950. Loans will mature May 31, 1950, or earlier on demand. Producers desiring to deliver soybeans under a purchase agreement must declare their intention to sell within a 30-day period ending May 31, 1950 or ending on such earlier date as may be determined.

Last year, loans and purchase agreements were available on 1943-crop soybeans through December 31, 1943, and the loan maturity date was set at April 30, 1949. This year, both availability and maturity dates have been extended so as to strengthen the price support mechanism.

Through December 31, 1943, farmers put 6,536,614 bushels of 1943-crop soybeans under loan, and 4,057,371 bushels under purchase agreement.

In computing comparable prices for soybeans a derived base price is used. As of March 15, the comparable price for soybeans was \$2.36 a bushel. Ninety percent of this price would be \$2.12 per bushel. The price support for 1943-crop green and yellow soybeans grading U. S. No. 2 and containing not more than 14 percent moisture was \$2.18 a bushel, and for 1947 it was \$2.04 a bushel.

The Department pointed out the importance of adequate storage in carrying out support operations through Commodity Credit Corporation loans and purchase agreements. It urged producers to give serious consideration in advance to their own individual storage needs in order to insure orderly marketing in 1949.

● STANDARDS REVISED. Revised official grain standards for soybeans, designed to meet present usages of the trade—including producers, country and terminal handlers, and processors—more effectively than the standards now in use were promulgated Apr. 20 by Secretary of Agriculture Brannan. The revised standards become effective September 1.

The new standards combine dockage and foreign material into one factor to be known as "foreign material". As a result of this combination, the new maximum limits for foreign material are increased by 1 percent in each grade. Under present standards, dockage is assessed in terms of whole percent and fractions of a percent are disregarded. Under the new standards, all fraction fractions will be included.

Moisture limits are unchanged in the new standards, but the percentage of splits permitted in grades 2, 3, and 4 is increased. Another change is a redefinition of "yellow soybeans" to include soybeans having yellow or

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green seed coats, and which in cross section are yellow or have a yellow tinge. There is also a special limitation of 2 percent of soybeans of other class in grade No. 2 yellow soybeans.

The revised standards were promulgated after public hearings on this subject during the past 2 years. Hearings were held in 1947 and 1948 in Ohio, Illinois, and Iowa, where interested persons were given opportunity to express their views at these hearings or to submit opinions in writing.

● STOCKS ON FARMS. Soybean stocks on farms April 1 amounted to 51.6 million bushels, the highest for the date since 1943, the first year of the farm stocks estimates for soybeans, reports the U. S. Department of Agriculture crop reporting board. Last year on April 1 farm stocks of 33.1 million bushels were near the 1943-47 average of 35.3 million bushels.

Although farm stocks are at near record levels, the disappearance from farms for the January-April quarter this year was also large. Farm disappearance for the period totaled 23 million bushels. This compares with 19 million bushels for the same quarter a year ago and an average for the period of 18 million bushels.

Most soybean stocks are concentrated in the heavy producing North Central States where 48 million bushels or 93 percent of nation's total farm stocks are located. Illinois alone has about 20 million bushels on farms. The next largest stocks—10 million bushels—are in Iowa.

SOYBEAN STOCKS ON FARMS APRIL 1

State	Average 1943-47	1948		1949		State	Average 1943-47	1948		1949	
		Thousands	bushels	Thousands	bushels			Thousands	bushels	Thousands	bushels
N. Y.	98	52	16	Del.	209	158	195				
N. J.	87	56	38	Md.	209	115	189				
Pa.	173	60	100	Va.	321	370	350				
Ohio	4,479	4,042	5,026	W. Va.	4	3	3				
Ind.	5,238	4,449	6,551	N. C.	907	734	927				
Ill.	11,317	10,472	19,626	S. C.	33	60	66				
Mich.	600	388	512	Ga.	24	34	39				
Miss.	263	108	78	Ky.	233	420	480				
Minn.	1,075	2,484	3,904	Tenn.	118	102	161				
Iowa	7,012	6,132	9,924	Ala.	92	37	63				
Mo.	1,495	1,782	1,088	Miss.	260	240	551				
S. Dak.	15	15	20	A. R.	421	288	360				
N. Dak.	16	115	195	La.	118	54	39				
Nebr.	78	84	126	Oklahoma	14	7	12				
Kans.	361	359	200	U. S.	35,320	33,110	65,644				

● SOYBEAN STOCKS. Production and Marketing Administration's commercial grain stocks reports for Mar. 28-Apr. 26.

	Mar. 28	Apr. 5	Apr. 12	Apr. 19	Apr. 26
Atlantic Coast	1,690	1,386	1,521	1,235	1,125
Gulf Coast	1,221	1,339	1,611	906	637
Northwestern and					
Upper Lake	612	548	480	389	234
Lower Lake	1,628	1,500	972	587	747
East Central	1,586	1,515	1,224	1,113	1,154
West Central					
Southwestern &					
Western	987	917	833	752	706
Total					
current week	7,724	7,205	6,631	4,986	4,603
Total year ago	8,209	7,613	6,613	5,761	5,101

● SHORTENING SHIPMENTS. Reported by members of the Institute of Shortening and Edible oils, Inc., in pounds:

Week ending Apr. 2	5,336,516
Week ending Apr. 9	5,190,149
Week ending Apr. 16	5,085,811
Week ending Apr. 23	4,948,844

Grand total of shortening and edible oils shipments for the first quarter of 1949 was 697,669,000 lbs., the Institute reports.

● EXPORT LICENSES. Export licenses issued for shipments of soybean oil and oil content of soybeans to European countries during the first quarter of 1949 exceeded 256 million pounds, or well over one-third of licenses for all U. S. fats and oils, reports the Department of Commerce through its Office of International Trade.

Licenses issued included: soybeans (oil content) 57,259,617 lbs.; soybean oil 198,912,617 lbs.

Fats and oils were placed under general license by OIT early in February. This means that fixed export quotas are no longer established and license applications are required only for shipment to "R group" countries.

● U. S. SOYBEAN EXPORTS. The following table shows United States exports of soybeans and soybean oil during 1948 with comparisons, as reported by Foreign Crops and Markets:

Country of destination	Refined soybean oil		Soybeans	
	Average 1935-39 ¹	1948 ²	Average 1937-39 ³	1948 ⁴
	1,000 Lbs.	1,000 Lbs.	1,000 Bu.	1,000 Bu.
North America:				
Canada	152	5,581	1,197	1,549
Cuba	3,833	8,062	*	*
Other	935	1,647	62	*
South America	301	1,776	*	*
Europe:				
Austria		10,263		1
Belgium and Luxembourg		8,973	15	979
Denmark		6,262	606	202
Finland		131	690	18
France			4,960	86
Germany			15,090	26
Iceland		23	619	*
Italy		4	484	*
Netherlands			1,650	2,066
Norway		35		484
Poland and Danzig			18	*
Sweden		211	10	604
Switzerland		100	3,594	1
Trieste			200	*
United Kingdom		2	6,392	59
Asia:		55	2,635	*
Oceania		42	73	*
Africa		7643	1,517	1
Total		6,467	80,529	4,793
				6,497

¹Not separately classified in Foreign Commerce and Navigation. ²Including crude in terms of refined. ³Preliminary.

⁴Not separately classified prior to January 1, 1937. ⁵Revised to include Army civilian supplies. ⁶Less than 500 bushels. ⁷Revised.

Compiled from official sources.

● OIL MILL PRODUCTS. Reported by Bureau of Census, U. S. Department of Commerce.

PRIMARY PRODUCTS EXCEPT CRUDE OIL AT CRUDE OIL MILL LOCATIONS: PRODUCTION, STOCKMENTS AND TRANSFERS AND STOCKS, FEBRUARY 1949

Products	Unit of measure	Shipments			End of month stock
		Production	Transfers	Month	
Soybean:					
Cake and meal	tons	367,817	368,320		31,069
Leatherness	lbs.	902,639	1,050,346	1,066,741	
Edible soy flour	tons	334	264		191
Edible soy flour, other	tons	2,774	2,975	1,902	(*)
Industrial soy flour	tons	(*)	(*)		(*)

(*) Not shown to avoid disclosure of individual operations.

RAW MATERIALS AT OIL MILLS: RECEIPTS, CRUSHINGS AND STOCKS, FEBRUARY 1949-JANUARY 1949

	Receipts at mill	Oil mill stocks end of month		
		Crushed or used	Feb. 28, 1949	Jan. 31, 1949
Raw Materials				
Feb. 1949	Feb. 1949	Jan. 1949	Feb. 28, 1949	Jan. 31, 1949
Soybeans	306,413	465,592	504,892	1,332,441
Cottonseed	114,775	519,611	613,834	1,259,982
Peanuts ¹ :				
Shelled	(*)	4,656	7,180	(*)
Unshelled	(*)	1,789	4,028	(*)
Corn germs	23,999	22,786	24,743	14,088
Copra	16,609	17,624	29,959	19,559
Flaxseed	43,227	84,160	74,170	148,757
Tung nuts	12,634	10,509	10,935	7,545
Castor beans	9,769	13,077	13,366	17,379
Olives	5,979	6,159	5,772	840
Other	10,625	9,474	13,366	5,277

¹ Bureau of Agricultural Economics U. S. Department of Agriculture collected data on crushings of peanuts.

² Data not available.

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SOYBEAN PRODUCTS: PRODUCTION AND STOCK AT OIL MILL LOCATIONS, BY STATES, FEBRUARY 1949—JANUARY 1949

State	Crude Oil		Cake and meal	
	Production	Stocks	Production	Stocks
U. S.	151,137	162,648	54,390	357,817
Ark.	1,870	2,866	1,197	4,938
Ill.	57,299	62,761	19,863	132,697
Ind.	12,256	12,338	3,026	29,872
Iowa	24,855	26,375	8,198	60,903
Kan.	4,127	4,342	2,505	10,679
Ky.	3,963	3,589	562	9,348
Minn.	9,375	9,488	2,965	21,563
Mo.	6,269	6,165	2,470	16,676
Neb.	1,543	1,519	1,089	4,084
N.C.	1,726	1,714	1,175	5,845
Ohio	16,388	16,399	6,157	39,933
Oklahoma	874	1,423	259	2,433
Texas	325	580	504	824
All other	10,576	12,462	5,180	28,022
*Included in "all other" to avoid disclosure of individual operations.				

SOYBEANS: RECEIPTS, CRUSHINGS AND STOCKS AT OIL MILLS, BY STATES, FEBRUARY 1949—JANUARY 1949 (Tons)

State	Receipts at mills		Crushed or used		Stocks at mills	
	February 1949	January 1949	February 1949	January 1949	February 1949	January 1949
U. S.	306,413	329,596	465,592	504,892	1,322,441	1,322,441
Ark.	534	3,216	6,303	10,262	56,480	56,480
Ill.	154,076	125,117	172,520	190,115	492,570	492,570
Ind.	15,938	14,193	38,211	37,852	123,293	123,293
Iowa	51,722	63,398	74,633	80,182	131,754	131,754
Kans.	8,896	14,265	13,088	13,772	15,330	15,330
Ky.	4,538	4,458	11,957	11,742	61,878	61,878
Minn.	3,843	14,438	27,177	27,647	72,444	72,444
Mo.	12,729	11,335	20,400	20,214	60,303	60,303
N. C.	1,988	2,289	1,588	4,855	13,400	13,400
Neb.	1,114	1,531	7,496	6,114	19,539	19,539
Ohio	33,375	42,425	50,300	53,474	189,733	189,733
Oklahoma	1,959	3,524	2,869	4,905	4,634	4,634
Texas	250	1,115	1,071	2,116	91,083	91,083
All Other	16,165	26,446	34,702	41,062		

● **SOYBEAN GLUE.** Consumption of soybean glue by the softwood plywood industry in February was 2,421,000 lbs., compared with 2,163,000 lbs. in January, and 2,095,000 lbs. in Feb. 1948.

Consumption of phenolic resin glue was 1,925,000 lbs. in January compared with 3,673,000 lbs. Jan. 1948. Total consumption of all glues was 5,032,000 lbs. in February compared with 4,572,000 lbs. in January and 6,424,000 lbs. Feb. 1948.

Stocks of soybean glue totaled 1,607,000 lbs. Feb. 28 compared with 1,914,000 Jan. 31 and 1,516,000 lbs. Feb. 29, 1948.

● **CAKE AND MEAL SUPPLIES.** Supplies of oilseed cake and meal for 1949-50 probably will be moderately smaller than the record supply available for 1943-49, if yields are about average on the prospective 1949 acreage of oilseed crops, reports the March Feed Situation of the Bureau of Agricultural Economics. The production of these feeds, however, probably will be close to the high level of other recent years.

Much of the prospective decrease in production from 1943-49 is in soybean cake and meal.

Combined production of other oilseed cakes and meals—linseed, cottonseed, peanut, and copra—may be about as large as in 1943-49.

● **IMPORTS OF SEED.** Imports of soybean seed admitted into the U. S. under the federal seed act totaled 209,300 lbs. in March, reports Production and Marketing Administration.

Total imports of soybean seed from July 1, 1948 to Mar. 31, 1949 were 365,400,000 lbs. according to PMA.

LETTERS

THE SOYBEAN BLUE BOOK

TO THE EDITOR:

Recently you were kind enough to forward us a copy of the Soybean Blue Book for 1949. We find this fine piece of literature of considerable interest and shall much appreciate it if you will kindly send us by return mail two extra copies, together with your corresponding debit note.—*G. Wedell, vice president East Asiatic Co., Inc., New York, N. Y.*

TO THE EDITOR:

The Soybean Blue Book for 1949 came today.

It is a much needed publication which is growing in size. It is chockfull with facts and statistics. I would not want to be without it for I refer to it innumerable times.

I am glad that the price is shown. Occasionally someone has been interested in getting a copy and wanted to know the cost.—*A. E. Leger, president Soy Flour Association, Chicago, Ill.*

TO THE EDITOR:

Please send me two copies of The Soybean Blue Book 1949, for which are enclosed \$2.

I find that this book is almost indispensable to research work on soybeans. It is not only the most convenient source of a variety of compiled data, but is the only good directory to the various associations of the soybean industry under one cover.

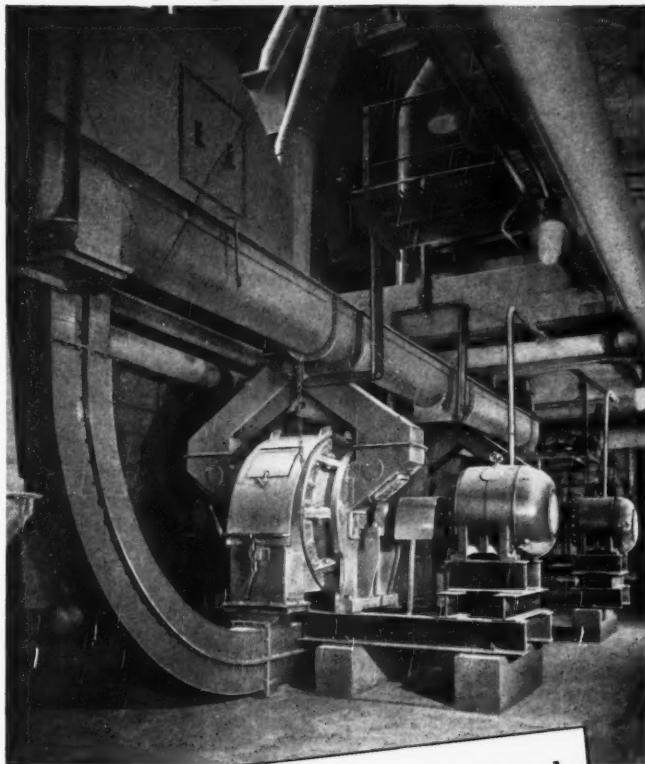
I am currently conducting the Illinois Experiment station project (No. 448) entitled "The Economic Validity of Factors Used in the Commercial Grading of Soybeans," which is closely related to a project being conducted by the Production and Marketing Administration (RMA 233.01).

If you know of others who are working on this same general problem I should be very glad to hear of them.—*Vincent J. West, assistant, agricultural economics, University of Illinois, Urbana, Ill.*

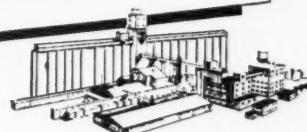
TO THE EDITOR:

We have just received a copy of your annual publication, the Soybean Blue Book, and wish to compliment you on its excellence.—*E. A. Beveridge, manager commodity research department, Merrill Lynch, Pierce, Fenner & Beane, New York, N. Y.*

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PRATER PULVERIZERS

"PROCESSORS ARE CAUGHT IN SQUEEZE"

TO THE EDITOR:

I read with interest your article "Where Get the Soybeans?"

The tone of the article is such that it would appear that the processors are to blame for the depression prices being paid for beans and yet a very small amount of figuring on your part would have proven to you that the expeller plants are losing about 12-18 cents a bushel depending upon their cost of operation. The solvent plants are only making about 8 cents a bushel which is not even a fair profit if you are going to stay in business with the ups and downs that are bound to occur as time rolls along.

You bring out the point that the farmer can make more by the raising of corn as compared to soybeans and will naturally turn to the raising of corn instead of soybeans. You do not take account the fact that a farmer in order to make up the fertility of his soil must rotate his crops. He has been doing this with the aid of white clover, red clover, alfalfa, and oats; and yet none of the four make a return that is in line with soybeans and unless I am mistaken the raising of soybeans is the most beneficial to the soil of any crop that can be planted with the possible exception of alfalfa.

I would not be surprised to see wheat sell for less than \$1.00 per bushel and I would say off-hand that corn will sell for about 70c a bushel by the first of December and I would also say that the situation of soybeans will be such that due to the probable less acreage, the shortage will mean that soybeans will probably be worth about \$2.25 per bushel.

Instead of the article that you wrote I would suggest that it would have been better if you would have written an article upon the valuable help soybeans give in keeping up the fertility of the soil.—H. R. Straight, Iowa Soya Co., Redfield, Iowa.

TO THE EDITOR:

We are at a loss to find an explanation for the attitude in the editorial and cartoon that the processor is to blame for the poor returns to the grower for his beans. As owners of a soybean processing plant we have done much serious thinking about this problem but as long as the current fats and oils situation remains as it is, there is nothing we can do

about it. Our operating margin is and has been for the past 30-60 days lower than at any time since before the war including the time when the ceilings were on and we thought we were hurting quite badly.

We agree with you that something should be done and we as processors are doing everything in our power including the financial help of a rather extensive crop improvement program but with the current fats and oils situation as it is and the government attempting to hold the prices up for the farmer we are caught in a squeeze that is going to be disastrous if something isn't done.

Also it seems that the doing is to have to come from your group rather than ours for we do not have many votes and we are given a rather cold shoulder in Washington. It would seem that it would take a combined program, which we will support to the fullest, of your association plus the cotton growers plus the hog growers to get the job done. The three groups just mentioned should have a rather loud voice and it will undoubtedly find some willing ears in Washington. We will be able to raise our bid on beans and willingly do so if we can but get a little larger return from the oil which we produce.—Don C. Ogg, Iowa Soya Co., Redfield, Iowa.

Editorial, "Where Get the Soybeans?" referred to in foregoing letter appeared on page 4 of the April Soybean Digest.—Editor.

NAMES SOME OF PIONEERS

TO THE EDITOR:

My attention was attracted to a letter in your March number of "Digest" bearing on the name for your "character" the little ASA booster.

I feel quite sure the letter I refer to in which an employee of A. E. Staley Co. suggesting he be called "Gus" Soya because "Gus" Staley was the first man to promote and process the soybean in the United States was prompted by enthusiasm for his employer.

A careful study of the pioneering of soybeans in the United States would hardly support the claims of his letter.

There were many men in the early soybean promotional work who had a most important bearing on things to come even before Staley evidenced



USDA's W. J. Morse, long known as the daddy of U. S. soybeans, gets acquainted with Little ASA. A number of our readers thought the little chap should have been named after Morse. See letter from I. C. Bradley on this page.

any concerted support. I would feel very reluctant to mention any one of 12 or 15 men as it was the unselfish, united effort of all that made the accomplishment quite wonderful. Some of these men have passed on, but I am sure those who are left should be happy for the participation they had in this new magic industry and be well satisfied to let records reveal, as they have, any outstanding contributions made by the early participants.

I know of no one connected with soybean development that has the right to feel as proud, and happy for his contribution to the successful achievement of purpose as "Bill" W. J. Morse.

Figuratively "Bill" can be called the "Daddy" of soybeans in the United States and figuratively he could have an ASA booster son.—I. C. Bradley, Allied Mills, Inc., Taylorville, Ill.

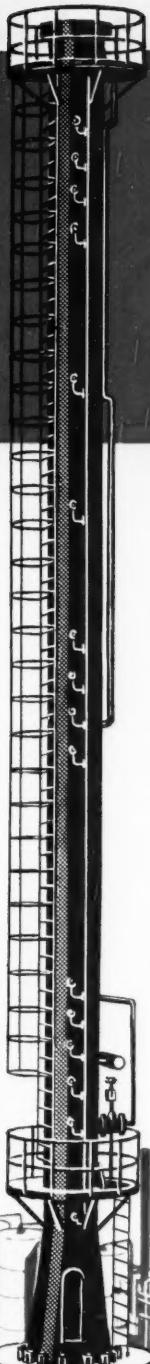
Little ASA's Genesis

TO THE EDITOR:

Little ASA certainly has created quite an interest among your readers.

When I first put him in the cartoon last September, I needed something to fill in for the corner of the cartoon. So I animated the bean which appears on the top of your letterhead, never expecting to ever use him again.

It's very gratifying to me to find that he has now a permanent home in your magazine. More length to his shadow.—O. W. Trag, Hawthorne, N. J.



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CHEMICAL PRODUCTS DEPARTMENT
Bartlesville, Oklahoma

SPECIAL SOLVENTS FOR SOYBEAN, COTTONSEED, FLAXSEED, TUNG NUT, RICE BRAN, CORN GERM, CASTOR BEAN, ALFALFA, ANIMAL FAT AND OTHER OIL EXTRACTION INDUSTRIES